

N90845.PF.001521  
NWIRP BETHPAGE  
5090.3b

QUARTERLY OPERATIONS REPORT THIRD QUARTER 2013 SOIL VAPOR EXTRACTION  
CONTAINMENT SYSTEM SITE 1 FORMER DRUM MARSHALLING YARD NWIRP  
BETHPAGE NY  
2/1/2014  
H&S ENVIRONMENTAL

**Quarterly Operations Report  
Third Quarter 2013**

**Soil Vapor Extraction Containment System  
Site 1, Former Drum Marshalling Yard  
Naval Weapons Industrial Reserve Plant  
Bethpage, New York**

**Contract No. N40085-10-D-9409  
Contract Task Order No. 0005**

February 2014

Prepared for:



Naval Facilities Engineering Command Mid-Atlantic  
9742 Maryland Avenue  
Norfolk, VA 23511

Prepared by:



**H&S Environmental, Inc.  
160 East Main Street, Suite 2F  
Westborough, Massachusetts 01581  
(508) 366-7442**

**Quarterly Operations Report  
Third Quarter 2013**

**Soil Vapor Extraction Containment System  
Site 1, Former Drum Marshalling Yard  
Naval Weapons Industrial Reserve Plant  
Bethpage, New York**

**Contract No. N40085-10-D-9409  
Contract Task Order No. 0005**

February 2014

Prepared for:

Naval Facilities Engineering Command Mid-Atlantic  
9742 Maryland Avenue  
Norfolk, VA 23511



Patrick Schuble, P.E.  
Program Manager

2/14/14

Date

  
Jennifer Good, P.G.  
Project Manager

2/14/14

Date

## TABLE OF CONTENTS

<b>1.0 INTRODUCTION.....</b>	<b>1-1</b>
1.1 Site Location.....	1-1
1.2 Background.....	1-1
1.3 Project Overview and Objective.....	1-2
1.4 SVECS Overview .....	1-2
<b>2.0 SVECS OPERATION AND MAINTENANCE .....</b>	<b>2-1</b>
2.1 Routine Maintenance Activities .....	2-1
2.2 Non-routine Maintenance / Site Activities .....	2-1
<b>3.0 SVECS MONITORING .....</b>	<b>3-1</b>
3.1 Monthly Air Quality Monitoring .....	3-1
3.2 Quarterly Air Quality Monitoring of SVEWs .....	3-1
3.3 Quarterly Vapor Monitoring of SVEWs and Off-site SVPMS.....	3-2
3.4 Annual Vapor Quality Monitoring of Off-site SVPMS .....	3-2
3.5 Soil Vapor Quality Concentration Trends .....	3-2
<b>4.0 CONCLUSIONS AND RECOMMENDATIONS.....</b>	<b>4-1</b>
<b>5.0 REFERENCES.....</b>	<b>5-1</b>

## TABLES

TABLE 1	Monthly Vapor Analytical Results – July 2013
TABLE 2	Monthly Vapor Analytical Results – August 2013
TABLE 3	Monthly Vapor Analytical Results – September 2013
TABLE 4	Quarterly Vapor Analytical Results of SVE Wells – Third Quarter 2013
TABLE 5	Quarterly Vapor Analytical Results of SVE Wells through Third Quarter 2013
TABLE 6	Quarterly Off-site Soil Vapor Monitoring Results of SVPMS – Third Quarter 2013
TABLE 7	Quarterly Off-site Soil Vapor Monitoring Results of SVPMS through Third Quarter 2013

## FIGURES

FIGURE 1	Site Location Map
FIGURE 2	Site Area and Vicinity
FIGURE 3	Site Plan – Existing SVECS Layout
FIGURE 4	System Layout Plan
FIGURE 5	Third Quarter 2013 Vapor Analytical Map – Select VOC Concentrations - SVEWs
FIGURE 6	Third Quarter 2013 Vacuum Readings – SVPMS

## **APPENDICES**

- |            |   |
|------------|---|
| APPENDIX A | NYSDEC Air Permit Equivalent Approval           |
| APPENDIX B | Vapor Concentration Trend Graphs of Select VOCs |

## Acronyms and Abbreviations

bgs	below ground surface
CTO	Contract Task Order
DAR	Division of Air Resources
DoD	Department of Defense
ELAP	Environmental Laboratory Accreditation Program
FMS	Flow Monitoring Station
GOCO	Government Owned Contractor Operated
H&S	H&S Environmental, Inc.
i.w.	inches of water column
NAVFAC	Naval Facilities Engineering Command Mid-Atlantic
NELAC	National Environmental Accreditation Conference
NG	Northrop Grumman
NWIRP	Naval Weapons Industrial Reserve Plant
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
O&M	Operation and Maintenance
PCB	polychlorinated biphenyls
PCE	tetrachloroethene
PID	photoionization detector
scfm	standard cubic feet per minute
SVECS	soil vapor extraction containment system
SVEW	soil vapor extraction well
SVOC	semi-volatile organic compound
SVPM	soil vapor pressure monitor
TCA	trichloroethane
TCE	trichloroethene
TCL	target compound list
TtEC	Tetra Tech EC, Inc.
TtNUS	Tetra Tech NUS, Inc.
VGAC	vapor-phase granular activated carbon
VOC	volatile organic compound

## 1.0 INTRODUCTION

H&S Environmental, Inc. (H&S) has prepared this Quarterly Operations Report for the Third Quarter 2013 for the Soil Vapor Extraction Containment System (SVECS) at Site 1, Former Drum Marshalling Area, at the Naval Weapons Industrial Reserve Plant (NWIRP) in Bethpage, New York. This report has been prepared for the U.S. Department of the Navy (Navy), Naval Facilities Engineering Command (NAVFAC), Mid-Atlantic, under Contract No. N40085-10-D-9409, Contract Task Order (CTO) No. 0005. This Third Quarter 2013 Operations Report details activities that occurred from July 2013 to September 2013. Data was collected and operational activities were performed by H&S in accordance with the following documents:

- *Final Operation & Maintenance Plan for Soil Vapor Extraction Containment System Site 1, Former Drum Marshalling Yard at Naval Weapons Industrial Reserve Plant Bethpage, New York* prepared by Tetra Tech EC, Inc. (TtEC) in 2010, hereafter referred to as the “O&M Manual.”
- *Final Supplemental Offsite Soil Vapor Intrusion Monitoring Plan for the Soil Vapor Extraction Containment System, Site 1, Former Drum Marshalling Yard at Naval Weapons Industrial Reserve Plant, Bethpage, New York* prepared by Tetra Tech NUS, Inc. (TtNUS) in 2012.

### 1.1 Site Location

NWIRP Bethpage is located in east central Nassau County, Long Island, New York, approximately 30 miles east of New York City. The Navy's property totaled approximately 109.5 acres and was formerly a Government Owned Contractor-Operated (GOCO) facility that was operated by Northrop Grumman (NG) until September 1998. NWIRP Bethpage is bordered on the north, west, and south by property owned, or formerly owned, by NG that covered approximately 520 acres, and on the east by a residential neighborhood. Site 1 lies within the fenced area of NWIRP Bethpage and is located east of Plant No. 3, west of 11<sup>th</sup> Street, and north of Plant 17 South (**Figures 1 and 2**).

### 1.2 Background

NWIRP Bethpage was established in 1943. Since inception, the primary mission of the facility has been the research, prototyping, testing, design engineering, fabrication, and primary assembly of military aircraft. Historical operations that resulted in hazardous material generation at the facility included metal finishing processes, maintenance operations, painting of aircraft and components, and other activities that involve aircraft manufacturing. Wastes generated by plant operations were disposed of directly into drainage sumps, dry wells, and/or on the ground surface, resulting in the disposal of a number of hazardous wastes, including volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), and inorganic analytes (chromium and cadmium) at the site. Some of these contaminants have migrated from the source area to surrounding areas, including the soils at these sites and the groundwater beneath and downgradient of the NWIRP Bethpage property. NWIRP Bethpage is currently listed by the New York State Department of Environmental Conservation (NYSDEC) as an “inactive hazardous waste site” (#1-30-003B).

Soils at Site 1 consist mainly of unconsolidated sediments that overlie crystalline bedrock. A clay unit is present near the groundwater table (50 feet below ground surface [bgs]) at the southeast corner of the site. This clay unit is suspected to be a source of chlorinated solvents that are migrating into the overlying soil gas and the source of off-site VOCs in soil vapor (TtEC 2010).

Chlorinated solvents including trichloroethene (TCE), tetrachloroethene (PCE), and 1,1,1-trichloroethane (TCA) have been identified as the VOCs of interest in soil gas at the site. Concentrations greater than 1,000 µg/m<sup>3</sup> (micrograms per cubic meter) of soil vapor have been directly associated with Site 1 activities and historical environmental data, and based on preliminary screening, exceed guidelines established by the New York State Department of Health (NYSDOH) for sub-slab soil vapor concentrations. Of these compounds, TCE is the primary VOC of concern. Mitigation of TCE contamination in accordance with NYSDOH guidance is expected to remediate other VOCs associated with the site. PCBs, cadmium, and chromium have also been identified in site soils at concentrations requiring remediation. The majority of these chemicals has been detected in the central portion of Site 1 and will be addressed via a separate remediation (TtEC 2010).

Prior to implementation of the SVECS, the mean concentrations of VOCs in soil gas samples collected along the eastern fence-line were 41,128 µg/m<sup>3</sup> of TCE, 381 µg/m<sup>3</sup> of PCE, and 20,634 µg/m<sup>3</sup> of 1,1,1-TCA. The maximum concentrations of VOCs in the soil gas samples were 180,000 µg/m<sup>3</sup> of TCE, 1,200 µg/m<sup>3</sup> of PCE, and 90,000 µg/m<sup>3</sup> of 1,1,1-TCA (TtEC 2010).

### **1.3 Project Overview and Objective**

The remedial objective for this project is to use an on-site soil vapor extraction system to prevent further off-site migration of VOC contaminated soil vapor and to the extent practical, capture contaminated soil vapor with a TCE concentration greater than 250 µg/m<sup>3</sup>. A secondary objective of this project is to address soil vapor with a TCE concentration greater than 5 µg/m<sup>3</sup>. The SVECS is an interim action intended to address migration of VOCs in contaminated soil vapors and has been designed for a four-year operational life; it is expected to operate continuously 24 hours/day, seven days/week, with the exception of maintenance and adjustment periods (TtEC 2010).

### **1.4 SVECS Overview**

The SVECS consists of soil vapor extraction, soil vapor monitoring, and soil vapor treatment. Twelve SVE wells (SVEWs) are located along the eastern boundary of Site 1 in six clusters, each consisting of one intermediate well and one deep well. Intermediate wells SVE-101I, SVE-102I, SVE-103I, SVE-104I, SVE-105I, and SVE-106I have a screened interval between 25 and 35 ft bgs. Deep wells SVE-101D, SVE-102D, SVE-103D, SVE-104D, SVE-105D, and SVE-106D have a screened interval between 40 and 60 ft bgs. The groundwater table fluctuates between approximately 50 and 55 feet bgs. Each SVEW is operated at a flow rate such that the combined total flow rate is approximately 400 standard cubic feet per minute (scfm) of soil vapor. Each intermediate depth SVEW requires an approximate vacuum of 4 inches of water column (i.w.) and each deep SVEW requires an approximate vacuum of 20 i.w. in order to extract the targeted flow rates. These twelve SVEWs have been piped below the ground to the Flow Monitoring Station (FMS), where flow, vacuum, and vapor quality are monitored. Within the FMS, the

discharges from the individual SVEWs have been equipped with a 2-inch flow control butterfly valve, a vacuum gauge, and a sampling port. The sampling port is utilized to measure the flow rate from an individual well using a portable velocity meter and to collect vapor samples. All the SVE lines collect into a single manifold within the FMS and from this location a single underground pipeline has been routed approximately 1,400 linear feet to the Treatment Building (Building 03-35). Five additional SVEWs (SV-107D, SV-108D, SV-109D, SV-110D, and SV-11D) were installed in October 2011 to address potential VOCs under Plant No. 3 and the South Warehouse. A site plan depicting well locations is included as **Figure 3**.

The SVECS is housed within the Treatment Building, an existing and unoccupied building also known as Building 03-35. The treatment system consists of a moisture separator, two SVE blowers, and a 5,000-lb vapor-phase granular activated carbon (VGAC) unit for removal of chlorinated VOCs from the off-gas. Soil vapor that enters the Treatment Building first passes through the moisture separator tank where any condensate is separated. To date, no condensate has formed in this tank. The vapor is then passed through an air filter and SVE blower and then treated in the VGAC unit. The treated vapor is discharged from the VGAC via an exhaust stack. The SVECS has a control panel comprised of mechanical interlocks and relays for local operation. A System Layout Plan is presented in **Figure 4**, which also illustrates the design flow rates through the soil vapor extraction and treatment process.

The off-gas from the SVECS is monitored for chlorinated VOCs as identified in the NYSDEC Division of Air Resources (DAR) permit equivalent effluent limitations (**Appendix A**) and monitoring requirements (TtEC 2010). Samples are submitted to a National Environmental Laboratory Accreditation Conference (NELAC)-accredited, Department of Defense (DoD) Environmental Laboratory Accreditation Program (ELAP)-certified laboratory, Air Toxics, Inc. located in Folsom, CA, for analysis of target compound list (TCL) VOCs, including PCE, 1,1,1-TCA, and TCE , by modified method TO-15.

A total of 18 soil vapor pressure monitor (SVPMP) / soil gas monitoring points have been installed in the neighborhood east of Site 1 at NWIRP Bethpage (**Figure 3**). These off-site monitoring points consist of eight previously existing SVPMPs as well as 10 SVPMPs installed in September 2012. Pressure readings from the SVPMPs are collected quarterly and used to evaluate the SVECS vacuum field. In addition, analytical results of vapor samples collected annually from these locations and the pressure readings are used to further evaluate the SVECS operation and the potential for vapor intrusion.

## **2.0 SVECS OPERATION AND MAINTENANCE**

While designed to run autonomously, the SVECS requires regular visits by an operator to record and adjust operational parameters and to perform scheduled maintenance. The SVECS is equipped with telemetry that will alert an on-call operator in the event of a plant shutdown.

### **2.1 Routine Maintenance Activities**

Routine maintenance activities at the SVECS were performed during the operator's weekly visits during this reporting period. These activities include general site inspections (of the grounds, buildings, doors and locks), collection of operational data (vapor flowrates, pressures, vacuums, temperature and photoionization detector [PID] readings), adjustment of system valves, collection of vapor samples (on a monthly and quarterly basis), collection/disposal of condensate if needed, cleaning of filters, switching of lead/lag blower assignments, and preventive maintenance of system equipment.

### **2.2 Non-routine Maintenance / Site Activities**

No non-routine activities or repair items of note were performed during this quarterly reporting period.

## 3.0 SVECS MONITORING

Several process vapor samples are collected on a monthly basis to monitor the SVECS operation. These samples consist of an influent sample (as well as a duplicate sample), located immediately prior to the VGAC unit, and an effluent sample, located after the VGAC unit and before the exhaust stack. Vapor samples are also collected from the 12 original SVEWs on a quarterly basis to monitor the capture of the contaminated soil vapor by the SVEWs. In addition, quarterly pressure measurements are collected from the SVEWs and SVPMs to monitor the SVECS vacuum field, and soil gas sampling for SVPMs is conducted annually (generally in the winter time-frame) to evaluate the effectiveness of the SVECS.

### 3.1 Monthly Air Quality Monitoring

Analysis of influent and effluent vapor sample locations is performed to evaluate VOC mass removal and the effectiveness of the VGAC adsorption unit. Time-integrated vapor samples are collected using 6-L summa canisters with 30-minute flow regulators.

Treated off-gas discharged at the exhaust stack is subject to emissions limitations and associated calculations approved by the NYSDEC DAR in February 2010. A copy of the NYSDEC approved calculations is presented in the Air Permit Equivalent included as **Appendix A**.

A summary of monthly vapor sampling results collected in July, August, and September (Third Quarter) is presented in **Tables 1, 2, and 3**, respectively. Emission rate calculations for both the influent stream (prior to VGAC treatment) and effluent stream (following VGAC treatment) and estimated monthly mass recoveries are also presented. Emission rates of the influent stream are calculated to monitor progress and determine when influent concentrations have reached levels at which vapor treatment via carbon adsorption is no longer required. The data presented in **Tables 1, 2, and 3** demonstrate that all constituents were within the effluent emission rates (**Appendix A**). Raw analytical data is provided under a separate cover.

### 3.2 Quarterly Air Quality Monitoring of SVEWs

Time-integrated vapor samples are collected quarterly using 6-L summa canisters with 30-minute flow regulators at six intermediate and six deep SVE wells. The samples are collected for the purpose of tracking and documenting the performance of the SVECS (TtEC 2010).

Quarterly vapor samples were collected on 27 August from the 12 SVEWs. A summary of detected compounds is included as **Table 4**. Analytical results of select VOCs (1,1,1-TCA, PCE, and TCE) detected at the 12 SVEWs during the Third Quarter monitoring event are presented graphically as **Figure 5**. Raw analytical data is provided under a separate cover. Historical analytical results of quarterly vapor samples collected from December 2009 through the Third Quarter 2013 are presented in **Table 5**.

### 3.3 Quarterly Vapor Monitoring of SVEWs and Off-site SVPMs

Pressure readings are collected quarterly from the 12 SVEWs and 18 SVPMs in order to monitor the SVECS vacuum field. Valve positions of the SVEWs are also recorded at this time. Pressure readings from the 18 SVPMs were collected on 27 August. Results of the Third Quarter vapor monitoring are presented in **Table 6**. As indicated, vacuum/soil vapor pressure measurements ranged from (+) 0.02 to (-) 0.18 i.w. during the Third Quarter monitoring event. Pressure readings from the 18 SVPMs are presented graphically as **Figure 6**.

Historical results of quarterly vapor monitoring from Third Quarter 2012 through Third Quarter 2013 are presented in **Table 7**.

### 3.4 Annual Vapor Quality Monitoring of Off-site SVPMs

Time-integrated vapor samples are collected annually using 6-L summa canisters with 30-minute flow regulators at 18 SVPM locations. As stated previously, annual soil gas sampling for SVPMs is performed in the winter time-frame; therefore, no soil gas samples were collected from the SVPMs during the Third Quarter. The next annual sample collection is scheduled to occur in January 2014.

### 3.5 Soil Vapor Quality Concentration Trends

Historical vapor analytical results for the 12 SVEWs through the Third Quarter are presented in **Table 5**. In addition, concentration trends of select VOCs over time for the SVECS combined influent (1,1,1-TCA, PCE, TCE, and total VOCs) and each of the 12 SVEWs (1,1,1-TCA, PCE, and TCE) are presented in **Appendix B**.

Concentration trends observed in the 12 SVEWs through the Third Quarter are discussed below. In general, unless otherwise indicated, concentrations of 1,1,1-TCA, PCE, and TCE exhibited similar trends at each given location.

- Combined Influent: Overall VOC concentrations in the combined influent increased slightly throughout the Third Quarter, with total VOC concentrations of 2,054 µg/m<sup>3</sup>, 1,690 µg/m<sup>3</sup>, and 2,484 µg/m<sup>3</sup> in July, August, and September, respectively. Overall concentrations remain well below baseline concentrations observed in December 2009 when a total VOC concentration of 63,650 µg/m<sup>3</sup> was observed.
- SV-101I: Concentrations observed at this location increased slightly in the Third Quarter from concentrations observed in the Second Quarter, with concentrations of 5,400 µg/m<sup>3</sup> TCE, 79 µg/m<sup>3</sup> PCE, and 2,200 µg/m<sup>3</sup> 1,1,1-TCA. All concentrations remain well below baseline concentrations observed in December 2009 (180,000 µg/m<sup>3</sup> TCE, 1,700 µg/m<sup>3</sup> PCE, and 51,000 µg/m<sup>3</sup> 1,1,1-TCA), which were also peak concentrations observed to date.
- SV-101D: Concentrations observed at this location increased in the Third Quarter from concentrations observed in the Second Quarter, with concentrations of 56 µg/m<sup>3</sup> TCE, 73 µg/m<sup>3</sup> PCE, and 5.6 µg/m<sup>3</sup> 1,1,1-TCA. All concentrations remain well below baseline concentrations

observed in December 2009 ( $100,000 \mu\text{g}/\text{m}^3$  TCE,  $3,200 \mu\text{g}/\text{m}^3$  PCE, and  $26,000 \mu\text{g}/\text{m}^3$  1,1,1-TCA), which were also peak concentrations observed to date.

- SV-102I: Concentrations observed at this location increased in the Third Quarter from concentrations observed in the Second Quarter, with concentrations of  $49 \mu\text{g}/\text{m}^3$  TCE,  $3.3 \mu\text{g}/\text{m}^3$  PCE, and  $4.6 \mu\text{g}/\text{m}^3$  1,1,1-TCA. Though Third Quarter concentrations are above baseline concentrations observed in December 2009 ( $5.6 \mu\text{g}/\text{m}^3$  TCE,  $2.4 \mu\text{g}/\text{m}^3$  PCE, and non-detectable 1,1,1-TCA), the concentrations are well below peak concentrations observed in June 2010 ( $300 \mu\text{g}/\text{m}^3$  TCE,  $17 \mu\text{g}/\text{m}^3$  PCE, and  $13 \mu\text{g}/\text{m}^3$  1,1,1-TCA).
- SV-102D: Concentrations observed at this location increased in the Third Quarter from concentrations observed in the Second Quarter, with concentrations of  $88 \mu\text{g}/\text{m}^3$  TCE,  $14 \mu\text{g}/\text{m}^3$  PCE, and  $2.3 \mu\text{g}/\text{m}^3$  1,1,1-TCA. Concentrations remain well below baseline concentrations observed in December 2009 for TCE and 1,1,1-TCA ( $440 \mu\text{g}/\text{m}^3$  TCE,  $10 \mu\text{g}/\text{m}^3$  PCE, and  $130 \mu\text{g}/\text{m}^3$  1,1,1-TCA), and also well below peak concentrations observed in December 2009 and October 2011.
- SV-103I: Concentrations observed at this location increased in the Third Quarter from concentrations observed in the Second Quarter, with concentrations of  $95 \mu\text{g}/\text{m}^3$  TCE,  $220 \mu\text{g}/\text{m}^3$  PCE, and  $4.7 \mu\text{g}/\text{m}^3$  1,1,1-TCA. Concentrations remain well below baseline concentrations observed in December 2009 ( $900 \mu\text{g}/\text{m}^3$  TCE,  $580 \mu\text{g}/\text{m}^3$  PCE, and  $900 \mu\text{g}/\text{m}^3$  1,1,1-TCA), and also well below peak concentrations observed in December 2009 and October 2011.
- SV-103D: Concentrations observed at this location increased in the Third Quarter from concentrations observed in the Second Quarter, with concentrations of  $660 \mu\text{g}/\text{m}^3$  TCE,  $4,900 \mu\text{g}/\text{m}^3$  PCE, and  $170 \mu\text{g}/\text{m}^3$  1,1,1-TCA. Concentrations remain well below baseline concentrations observed in December 2009 ( $3,100 \mu\text{g}/\text{m}^3$  TCE,  $20,000 \mu\text{g}/\text{m}^3$  PCE, and  $3,000 \mu\text{g}/\text{m}^3$  1,1,1-TCA), and also well below peak concentrations observed in December 2009 and March 2010.
- SV-104I: Concentrations observed at this location increased in the Third Quarter from concentrations observed in the Second Quarter, with concentrations of  $30 \mu\text{g}/\text{m}^3$  TCE,  $30 \mu\text{g}/\text{m}^3$  PCE, and  $3.1 \mu\text{g}/\text{m}^3$  1,1,1-TCA. All concentrations remain well below baseline concentrations observed in December 2009 ( $710 \mu\text{g}/\text{m}^3$  TCE,  $3,100 \mu\text{g}/\text{m}^3$  PCE, and  $730 \mu\text{g}/\text{m}^3$  1,1,1-TCA) which were also peak concentrations observed to date.
- SV-104D: Concentrations observed at this location in the Third Quarter increased from those observed in the Second Quarter, with concentrations of  $1,200 \mu\text{g}/\text{m}^3$  TCE,  $2,600 \mu\text{g}/\text{m}^3$  PCE, and  $500 \mu\text{g}/\text{m}^3$  1,1,1-TCA. All concentrations remain below baseline concentrations observed in December 2009 ( $4,600 \mu\text{g}/\text{m}^3$  TCE,  $20,000 \mu\text{g}/\text{m}^3$  PCE, and  $3,600 \mu\text{g}/\text{m}^3$  1,1,1-TCA) and also well below peak concentrations observed in December 2009 and March 2010.
- SV-105I: Concentrations observed at this location in the Third Quarter increased from those observed in the Second Quarter, with concentrations of  $220 \mu\text{g}/\text{m}^3$  TCE,  $91 \mu\text{g}/\text{m}^3$  PCE, and  $24 \mu\text{g}/\text{m}^3$  1,1,1-TCA. Though these concentrations are above baseline concentrations observed in

December 2009 ( $76 \mu\text{g}/\text{m}^3$  TCE,  $70 \mu\text{g}/\text{m}^3$  PCE, and  $9.9 \mu\text{g}/\text{m}^3$  1,1,1-TCA), they are below peak concentrations observed in June 2010 ( $370 \mu\text{g}/\text{m}^3$  TCE,  $240 \mu\text{g}/\text{m}^3$  PCE, and  $29 \mu\text{g}/\text{m}^3$  1,1,1-TCA).

- SV-105D: Concentrations observed at this location in the Third Quarter decreased somewhat from concentrations observed in the Second Quarter, with concentrations of  $900 \mu\text{g}/\text{m}^3$  TCE,  $140 \mu\text{g}/\text{m}^3$  PCE, and  $110 \mu\text{g}/\text{m}^3$  1,1,1-TCA. These concentrations are below baseline concentrations observed in December 2009 ( $1,700 \mu\text{g}/\text{m}^3$  TCE,  $2,100 \mu\text{g}/\text{m}^3$  PCE, and  $550 \mu\text{g}/\text{m}^3$  1,1,1-TCA), and also below peak concentrations observed for all three analytes.
- SV-106I: Concentrations observed at this location in the Third Quarter were similar, though slightly decreased, from those observed in the Second Quarter, with non-detectable levels of all three analytes. All concentrations remain well below baseline concentrations observed in December 2009 ( $1,900 \mu\text{g}/\text{m}^3$  TCE,  $390 \mu\text{g}/\text{m}^3$  PCE, and  $220 \mu\text{g}/\text{m}^3$  1,1,1-TCA), which were also peak concentrations observed to date.
- SV-106D: Concentrations observed at this location in the Third Quarter increased from those observed in the Second Quarter, with concentrations of  $460 \mu\text{g}/\text{m}^3$  TCE,  $50 \mu\text{g}/\text{m}^3$  PCE, and  $27 \mu\text{g}/\text{m}^3$  1,1,1-TCA. These concentrations are well below baseline concentrations observed in December 2009 ( $3,400 \mu\text{g}/\text{m}^3$  TCE,  $720 \mu\text{g}/\text{m}^3$  PCE, and  $340 \mu\text{g}/\text{m}^3$  1,1,1-TCA), which were also peak concentrations observed to date.

## **4.0 CONCLUSIONS AND RECOMMENDATIONS**

As stated previously, the intent of the Site 1 SVECS is to prevent further off-site migration of VOC contaminated soil vapor and to the extent practical, capture soil vapor with elevated TCE concentrations. Based on the presence of a vacuum field and the reduction of VOC concentrations to less than the screening values in the off-property area, the SVECS is functioning as designed. Influent vapor analytical data with concentrations of TCE consistently greater than 250 µg/L indicate that the SVECS should continue to be operated on a full-time basis to achieve continued capture of contaminated soil vapor. Monthly monitoring of the combined influent and effluent as well as quarterly monitoring of individual SVEWs should continue. Quarterly and annual monitoring of the SVPMs should also continue in order to ensure that a measurable vacuum field is being established and that the area is being effectively treated. Ongoing optimization activities should be performed in order to improve system performance.

## 5.0 REFERENCES

Tetra Tech EC, Inc. (TtEC). 2010. *Final Operation & Maintenance Plan for Soil Vapor Extraction Containment System, Site 1, Former Drum Marshalling Yard at Naval Weapons Industrial Reserve Plant, Bethpage, New York.* June.

Tetra Tech NUS, Inc. (TtNUS). 2012. *Final Supplemental Offsite Soil Vapor Intrusion Monitoring Plan for the Soil Vapor Extraction Containment System, Site 1, Former Drum Marshalling Yard at Naval Weapons Industrial Reserve Plant, Bethpage, New York.* February.

## **TABLES**

**Table 1**  
**Soil Vapor Extraction Containment System**  
**Site 1, Former Drum Marshalling Yard**  
**Naval Weapons Industrial Reserve Plant - Bethpage, NY**  
**Vapor Monitoring Results**  
**July 2013**

Compound	Concentration ( $\mu\text{g}/\text{m}^3$ )				Emission Rate <sup>(1),(2)</sup>				Monthly Mass Recovery <sup>(3)</sup> (lbs)
	Influent #1	Influent #2	Average	Effluent	Prior to Treatment (lbs/hr)	Following Treatment (lbs/hr)	(lbs/hr)	(lbs/yr)	
Acetone	12 J	5.6 J	8.8 J	14 J	0.0000	0.1049	0.0000	0.1668	0.0089
2-Butanone	4.4 J	3.2 J	3.8 J	3.2 J	0.0000	0.0453	0.0000	0.0381	0.0038
Carbon Disulfide	1.8 J	1.6 J	1.7 J	1.4 J	0.0000	0.0203	0.0000	0.0167	0.0017
Carbon Tetrachloride	2.0 J	1.7 J	1.9 J	0	0.0000	0.0220	0.0000	0.0000	0.0019
Chlorobenzene	1.6 J	1.2 J	1.4 J	1.2 J	0.0000	0.0167	0.0000	0.0143	0.0014
Chloroform	8.5	6.8	7.7	5.0	0.0000	0.0912	0.0000	0.0596	0.0077
Cumene	18	0	9.0	7.1	0.0000	0.1072	0.0000	0.0846	0.0091
1,3-Dichlorobenzene	0.92 J	0	0.46 J	0	0.0000	0.0055	0.0000	0.0000	0.0005
1,1-Dichloroethane	14	14	14	41	0.0000	0.1668	0.0001	0.4886	0.0142
1,2-Dichloroethane	1.1 J	1.0 J	1.1 J	0	0.0000	0.0125	0.0000	0.0000	0.0011
1,1-Dichloroethene	2.3 J	2.7 J	2.5 J	7.5	0.0000	0.0298	0.0000	0.0894	0.0025
cis-1,2-Dichloroethene	160	160	160	420	0.0002	1.9066	0.0006	5.0049	0.1619
trans-1,2-Dichloroethene	2.1 J	2.4 J	2.3 J	6.0	0.0000	0.0268	0.0000	0.0715	0.0023
Freon 11	5.7	5.8	5.8	12	0.0000	0.0685	0.0000	0.1430	0.0058
Freon 12	2.7 J	3.1 J	2.9 J	3.9	0.0000	0.0346	0.0000	0.0465	0.0029
Freon 113	54	62	58	81	0.0001	0.6911	0.0001	0.9652	0.0587
Heptane	3.4	2.9 J	3.2 J	0	0.0000	0.0375	0.0000	0.0000	0.0032
Hexane	11	11	11	0	0.0000	0.1311	0.0000	0.0000	0.0111
2-Hexanone	2.1 J	0	1.1 J	0	0.0000	0.0125	0.0000	0.0000	0.0011
Methylene Chloride	1.0 J	0	0.50 J	0	0.0000	0.0060	0.0000	0.0000	0.0005
Styrene	0.40 J	0	0.20 J	0	0.0000	0.0024	0.0000	0.0000	0.0002
Tetrachloroethene	560	590	575	1.7 J	0.0008	6.8519	0.0000	0.0203	0.5819
Toluene	1.3 J	0.68 J	1.0 J	0	0.0000	0.0118	0.0000	0.0000	0.0010
1,1,1-Trichloroethane	290	290	290	130	0.0004	3.4557	0.0002	1.5491	0.2935
Trichloroethene	790	860	825	46	0.0011	9.8310	0.0001	0.5482	0.8350
1,2,4-Trimethylbenzene	0.97 J	0	0.49 J	0	0.0000	0.0058	0.0000	0.0000	0.0005
2,2,4-Trimethylpentane	66	64	65	0	0.0001	0.7746	0.0000	0.0000	0.0658
m,p-Xylene	0.91 J	0	0.46 J	0	0.0000	0.0054	0.0000	0.0000	0.0005
o-Xylene	0.93 J	0	0.47 J	0	0.0000	0.0055	0.0000	0.0000	0.0005
Total VOCs	2019	2090	2054	781	0.0028	24.4810	0.0011	9.3067	2.0792

**Notes:**

All samples were analyzed for full list VOCs by modified method TO-15. Only detected analytes are presented above.

Average Monthly Vapor Temp (°F) = 117  
 Average Monthly Flowrate (cfm) = 397  
 Average Monthly Flowrate (scfm) = 363  
 Operational Hours for the month = 744

(1) Emissions (lbs/hr) = Concentration ( $\mu\text{g}/\text{m}^3$ ) \* (lb/454000000ug) \* (0.3048 $\times$ 3 $\text{m}^3/\text{ft}^3$ ) \* exhaust flow (scfm) \* (60min/hour)

(2) Emissions (lbs/yr) = Emissions (lbs/hour) \* (8760hours/yr)

(3) Monthly Mass Removal = AVERAGE FLOWRATE (scfm) \* 0.3048 $\times$ 3 $\text{m}^3/\text{ft}^3$  \* INF AVG CONC ( $\mu\text{g}/\text{m}^3$ ) \* (lb/454000000ug) \* 60 min/hr \* OPERATIONAL TIME (hr)

**Table 2**  
**Soil Vapor Extraction Containment System**  
**Site 1, Former Drum Marshalling Yard**  
**Naval Weapons Industrial Reserve Plant - Bethpage, NY**  
**Vapor Monitoring Results**  
**August 2013**

Compound	Concentration ( $\mu\text{g}/\text{m}^3$ )				Emission Rate <sup>(1),(2)</sup>				Monthly Mass Recovery <sup>(3)</sup> (lbs)
	Influent #1	Influent #2	Average	Effluent	Prior to Treatment (lbs/hr)	Following Treatment (lbs/hr)	(lbs/hr)	(lbs/yr)	
Acetone	13 J	5.6 J	9.3 J	5.6 J	0.0000	0.1120	0.0000	0.0674	0.0095
alpha-Chlorotoluene	0.54 J	0.50 J	0.52 J	0	0.0000	0.0063	0.0000	0.0000	0.0005
Benzene	0.55 J	1.1 J	0.83 J	0	0.0000	0.0099	0.0000	0.0000	0.0008
Bromomethane	1.5 J	0	0.75 J	0	0.0000	0.0090	0.0000	0.0000	0.0008
2-Butanone	2.2 J	3.4 J	2.8 J	0	0.0000	0.0337	0.0000	0.0000	0.0029
Carbon Disulfide	1.7 J	1.6 J	1.7 J	1.4 J	0.0000	0.0199	0.0000	0.0169	0.0017
Carbon Tetrachloride	0.88 J	1.6 J	1.2 J	0	0.0000	0.0149	0.0000	0.0000	0.0013
Chlorobenzene	1.5 J	1.5 J	1.5 J	1.3 J	0.0000	0.0181	0.0000	0.0157	0.0015
Chloroform	3.3	7.1	5.2	4.4	0.0000	0.0626	0.0000	0.0530	0.0053
Cumene	27	9.6	18	4.2	0.0000	0.2204	0.0000	0.0506	0.0187
Cyclohexane	0	0	0	4.6	0.0000	0.0000	0.0000	0.0554	0.0000
1,2-Dichlorobenzene	0.91 J	0	0.46 J	0	0.0000	0.0055	0.0000	0.0000	0.0005
1,3-Dichlorobenzene	0.90 J	0	0.45 J	0	0.0000	0.0054	0.0000	0.0000	0.0005
1,4-Dichlorobenzene	1.0 J	0	0.50 J	0	0.0000	0.0060	0.0000	0.0000	0.0005
1,1-Dichloroethane	5.2	11	8.1	31	0.0000	0.0975	0.0000	0.3733	0.0083
1,2-Dichloroethane	0.74 J	0.81 J	0.78 J	0	0.0000	0.0093	0.0000	0.0000	0.0008
1,1-Dichloroethene	1.8 J	2.4 J	2.1 J	7.2	0.0000	0.0253	0.0000	0.0867	0.0021
cis-1,2-Dichloroethene	85	160	123	390	0.0002	1.4753	0.0005	4.6967	0.1253
trans-1,2-Dichloroethene	1.1 J	2.4 J	1.8 J	4.2	0.0000	0.0211	0.0000	0.0506	0.0018
trans-1,3-Dichloropropene	0.67 J	0	0.34 J	0	0.0000	0.0040	0.0000	0.0000	0.0003
Ethanol	3.0 J	9.8	6.4 J	0	0.0000	0.0771	0.0000	0.0000	0.0065
4-Ethyltoluene	0.31 J	0.72 J	0.52 J	0	0.0000	0.0062	0.0000	0.0000	0.0005
Freon 11	2.8 J	3.5 J	3.2 J	4.8	0.0000	0.0379	0.0000	0.0578	0.0032
Freon 12	2.9 J	2.8 J	2.9 J	2.5 J	0.0000	0.0343	0.0000	0.0301	0.0029
Freon 113	35	65	50	85	0.0001	0.6021	0.0001	1.0236	0.0511
Hexane	0	1.2 J	0.60 J	0	0.0000	0.0072	0.0000	0.0000	0.0006
Methyl-tert-Butyl-Ether	0	0.96 J	0.48 J	0	0.0000	0.0058	0.0000	0.0000	0.0005
Methylene Chloride	0.80 J	1.2 J	1.0 J	0	0.0000	0.0120	0.0000	0.0000	0.0010
2-Propanol	0	1.8 J	0.90 J	0	0.0000	0.0108	0.0000	0.0000	0.0009
Tetrachloroethene	340	690	515	1.8 J	0.0007	6.2021	0.0000	0.0217	0.5268
Tetrahydrofuran	2.0	4.6	3.3	5.1	0.0000	0.0397	0.0000	0.0614	0.0034
Toluene	4.6	13	8.8	0.55 J	0.0000	0.1060	0.0000	0.0066	0.0090
1,1,1-Trichloroethane	120	250	185	140	0.0003	2.2279	0.0002	1.6860	0.1892
Trichloroethene	490	970	730	76	0.0010	8.7913	0.0001	0.9153	0.7467
2,2,4-Trimethylpentane	0.60 J	0.92 J	0.76 J	0	0.0000	0.0092	0.0000	0.0000	0.0008
m,p-Xylene	1.1 J	1.6 J	1.4 J	0	0.0000	0.0163	0.0000	0.0000	0.0014
o-Xylene	0.50 J	0.65 J	0.58 J	0	0.0000	0.0069	0.0000	0.0000	0.0006
Total VOCs	1153	2226	1690	770	0.0023	20.3492	0.0011	9.2688	1.7283

**Notes:**

All samples were analyzed for full list VOCs by modified method TO-15. Only detected analytes are presented above.

Average Monthly Vapor Temp (°F) = 110  
 Average Monthly Flowrate (cfm) = 397  
 Average Monthly Flowrate (scfm) = 367  
 Operational Hours for the month = 744

(1) Emissions (lbs/hr) = Concentration ( $\mu\text{g}/\text{m}^3$ ) \* (lb/454000000ug) \* (0.3048^3  $\text{m}^3/\text{ft}^3$ ) \* exhaust flow (scfm) \* (60min/hour)

(2) Emissions (lbs/yr) = Emissions (lbs/hour) \* (8760hours/yr)

(3) Monthly Mass Removal = AVERAGE FLOWRATE (scfm) \* 0.3048^3  $\text{m}^3/\text{ft}^3$  \* INF AVG CONC ( $\mu\text{g}/\text{m}^3$ ) \* (lb/454000000ug) \* 60 min/hr \* OPERATIONAL TIME (hr)

**Table 3**  
**Soil Vapor Extraction Containment System**  
**Site 1, Former Drum Marshalling Yard**  
**Naval Weapons Industrial Reserve Plant - Bethpage, NY**  
**Vapor Monitoring Results**  
**September 2013**

Compound	Concentration ( $\mu\text{g}/\text{m}^3$ )				Emission Rate <sup>(1),(2)</sup>				Monthly Mass Recovery <sup>(3)</sup> (lbs)	
	Influent #1		Influent #2		Prior to Treatment		Following Treatment			
	Average	Effluent	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)				
Acetone	9.0 J	2.8 J	5.9 J	7.5 J	0.0000	0.0712	0.0000	0.0906	0.0058	
2-Butanone	3.6 J	0	1.8 J	0	0.0000	0.0217	0.0000	0.0000	0.0018	
Carbon Tetrachloride	1.4 J	1.2 J	1.3 J	0	0.0000	0.0157	0.0000	0.0000	0.0013	
Chloroform	7.3	7.2	7.3	3.8 J	0.0000	0.0875	0.0000	0.0459	0.0071	
Cumene	11	0	5.5	6.3	0.0000	0.0664	0.0000	0.0761	0.0054	
1,1-Dichloroethane	14	13	14	32	0.0000	0.1630	0.0000	0.3864	0.0132	
1,2-Dichloroethane	0.85 J	0.78 J	0.82 J	0.40 J	0.0000	0.0098	0.0000	0.0048	0.0008	
1,1-Dichloroethene	1.6 J	2.2 J	1.9 J	4.9	0.0000	0.0229	0.0000	0.0592	0.0019	
cis-1,2-Dichloroethene	210	210	210	370	0.0003	2.5358	0.0005	4.4678	0.2049	
trans-1,2-Dichloroethene	3.1 J	3.8	3.5 J	5.2	0.0000	0.0417	0.0000	0.0628	0.0034	
Freon 11	3.5 J	3.6 J	3.6 J	5.0	0.0000	0.0429	0.0000	0.0604	0.0035	
Freon 12	2.4 J	2.5 J	2.5 J	2.5 J	0.0000	0.0296	0.0000	0.0302	0.0024	
Freon 113	81	80	81	69	0.0001	0.9721	0.0001	0.8332	0.0786	
Tetrachloroethene	850	860	855	0	0.0012	10.3244	0.0000	0.0000	0.8344	
Tetrahydrofuran	4.3	3.9	4.1	6.1	0.0000	0.0495	0.0000	0.0737	0.0040	
Toluene	0.69 J	0.46 J	0.58 J	0	0.0000	0.0069	0.0000	0.0000	0.0006	
1,2,4-Trichlorobenzene	0	0	0	0	0.0000	0.0000	0.0000	0.0000	0.0000	
1,1,1-Trichloroethane	290	290	290	130	0.0004	3.5018	0.0002	1.5698	0.2830	
Trichloroethene	990	1000	995	77	0.0014	12.0149	0.0001	0.9298	0.9711	
1,2,4-Trimethylbenzene	0.86 J	0	0.43 J	0	0.0000	0.0052	0.0000	0.0000	0.0004	
Vinyl Chloride	0	0.52 J	0.26 J	0.41 J	0.0000	0.0031	0.0000	0.0050	0.0003	
m,p-Xylene	0.72 J	0	0.36	0	0.0000	0.0043	0.0000	0.0000	0.0004	
Total VOCs	2485	2482	2484	720	0.0034	29.9906	0.0010	8.6955	2.4239	

**Notes:**

All samples were analyzed for full list VOCs by modified method TO-15. Only detected analytes are presented above.

Average Monthly Vapor Temp (°F) = 100  
 Average Monthly Flowrate (cfm) = 391  
 Average Monthly Flowrate (scfm) = 368  
 Operational Hours for the month = 708

(1) Emissions (lbs/hr) = Concentration ( $\mu\text{g}/\text{m}^3$ ) \* (lb/454000000ug) \* (0.3048 $\wedge$ 3 $\text{m}^3/\text{ft}^3$ ) \* exhaust flow (scfm) \* (60min/hour)

(2) Emissions (lbs/yr) = Emissions (lbs/hour) \* (8760hours/yr)

(3) Monthly Mass Removal = AVERAGE FLOWRATE (scfm) \* 0.3048 $\wedge$ 3 $\text{m}^3/\text{ft}^3$  \* INF AVG CONC ( $\mu\text{g}/\text{m}^3$ ) \* (lb/454000000ug) \* 60 min/hr \* OPERATIONAL TIME (hr)

**Table 4**  
**Soil Vapor Extraction Containment System**  
**Site 1, Former Drum Marshalling Yard**  
**Naval Weapons Industrial Reserve Plant - Bethpage, NY**  
**Third Quarter 2013 Vapor Analytical Results Summary of SVE Wells**

Sample ID	SVE 101I	SVE 101D	SVE 102I	SVE 102D	SVE 103I	SVE 103D	SVE 104I	SVE 104D	SVE 105I	SVE 105D	SVE 106I	SVE 106D
Sample Date	08/27/13	08/27/13	08/27/13	08/27/13	08/27/13	08/27/13	08/27/13	08/27/13	08/27/13	08/27/13	08/27/13	08/27/13
<b>Analysis by TO-15 (<math>\mu\text{g}/\text{m}^3</math>)</b>												
1,1,1-Trichloroethane	2200	5.6	1.6 J	2.3 J	4.7 J	170	3.1 J	500	24	110	ND	27
1,1-Dichloroethane	36	ND	ND	ND	1.5 J	10 J	ND	95	8.0	45	ND	4.9
1,1-Dichloroethene	8.9 J	ND										
1,2,4-Trimethylbenzene	ND	1.3 J	1.0 J	ND	1.5 J	ND	ND	ND	1.1 J	1.0 J	0.97 J	0.77 J
1,2-Dichloroethane	8.6 J	ND										
4-ethyltoluene	ND	0.90 J	0.66 J	ND	0.86 J	ND	ND	ND	0.73 J	0.64 J	0.82 J	ND
Acetone	ND	30	9.7 J	3.4 J	11 J	ND	12 J	6.4 J	10 J	11 J	23	5.1 J
Benzene	ND	0.48 J	ND									
Carbon Tetrachloride	ND	7.2	ND	6.1								
Chloroform	ND	1.2 J	3.7 J	21	ND	ND	ND	12	3.1 J	3.9	ND	4.1
Chloromethane	ND	1.6 J	ND									
cis-1,2-Dichloroethene	11 J	ND	ND	ND	11	700	3.3	2000	14	76	ND	10
Ethanol	ND	64	ND	9.6	ND	ND						
Freon 11	ND	3.0 J	2.1 J	4.4 J	1.7 J	ND	1.0 J	ND	1.3 J	1.4 J	1.0 J	1.8 J
Freon 113	ND	2.8 J	ND	ND	ND	35	2.3 J	1000	4.2 J	21	ND	13
Freon 12	ND	2.3 J	2.4 J	2.3 J	2.3 J	ND	2.4 J	2.6 J	2.4 J	2.5 J	2.1 J	3.9 J
m,p-Xylene	ND	1.1 J	ND									
Tetrachloroethene	79	73	3.3 J	14	220	4900	30	2600	91	140	ND	50
Tetrahydrofuran	ND	1.4 J	ND	ND	0.75 J	ND	0.74 J	ND	ND	1.8 J	ND	1.4 J
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	8.8 J	ND	24	ND	2.4 J	ND	ND
Trichloroethene	5400	56	49	88	95	660	30	1200	220	900	ND	460

**Notes:**

All samples were analyzed for full list VOCs by modified method TO-15. Only detected analytes are presented above.

$\mu\text{g}/\text{m}^3$  = micrograms per cubic meter

ND = Not detected above method detection limit

Bolded value indicates detected analyte.

**Table 5**  
**Soil Vapor Extraction Containment System**  
**Site 1, Former Drum Marshalling Yard**  
**Naval Weapons Industrial Reserve Plant - Bethpage, NY**  
**Quarterly Vapor Monitoring Results of SVE Wells**  
**Through Third Quarter 2013**

Sample ID	SVE 101I																	
Sample Date	12/21/09	03/31/10	06/09/10	09/16/10	12/08/10	03/30/11	06/28/11	09/06/11	10/14/11	02/10/12	05/11/12	09/11/12	12/05/12	01/15/13	05/16/13	08/27/13		
Analysis by TO-15 ( $\mu\text{g}/\text{m}^3$ )																		
1,1,1-Trichloroethane	51000	3900	2600	450	850	300	1	0.7 J	0.7 J	1500	1500	3200	4400	3400	1900	2200		
1,1,2,2-Tetrachloroethane	NR	NR	NR	ND	ND	ND	1 J	0.7 J	0.8 J	ND								
1,1,2-Trichloroethane	NR	NR	NR	3	5	ND	1 J	0.6 J	0.6 J	4.0 J	ND	ND	ND	ND	ND	ND		
1,1-Dichloroethane	1200	65	34	14	31	5	0.8 J	0.4 J	0.4 J	28	28	61	76	62	35	36		
1,1-Dichloroethene	250	ND	ND	4	8	ND	0.7 J	0.4 J	0.5 J	7.6 J	10	ND	15 J	ND	12 J	8.9 J		
1,2,3-Trichloropropane	NR	NR	NR	ND	ND	ND	1 J	0.6 J	0.8 J	NR								
1,2,3,Trimethylbenzene	NR	NR	NR	6	2	ND	0.6 J	ND	0.5 J	NR								
1,2,4-Trichlorobenzene	NR	NR	NR	ND														
1,2,4-Trimethylbenzene	NR	NR	NR	15	5	2	1	ND	0.7 J	ND	3.2 J	5.1 J	ND	ND	ND	ND		
1,2-Dibromoethane	NR	NR	NR	ND	ND	ND	ND	0.8 J	ND									
1,2-Dichlorobenzene	NR	NR	NR	ND	ND	ND	0.6	ND	0.6 J	ND								
1,2-Dichloroethane	NR	NR	NR	30	ND	4	8	ND	0.9	0.5 J	0.5 J	6.9 J	6.4 J	11 J	14 J	12 J	10 J	8.6 J
1,2-Dichloropropane	NR	NR	NR	ND	ND	ND	ND	0.6 J	0.6 J	ND								
1,3,5-Trimethylbenzene	NR	NR	NR	4	ND	ND	0.6 J	ND	0.5 J	ND								
1,3-Butadiene	NR	NR	NR	ND	ND	ND	0.7	0.4 J	0.4 J	ND								
1,3-Dichlorobenzene	NR	NR	NR	ND														
1,4-Dichlorobenzene	NR	NR	NR	ND														
1,4-Dioxane	NR	NR	NR	ND														
2,2,4-Trimethylpentane	NR	ND	ND	6.7 J	ND	ND	ND	ND										
2-Butanone	NR	NR	NR	3	1	ND	3	1	1	ND								
2-Hexanone	NR	NR	NR	ND	ND	ND	ND	0.5 J	0.5 J	ND								
2-Propanol	NR	ND																
3-Chloro-1-propene	NR	NR	NR	ND	ND	ND	ND	0.4 J	ND									
4-Ethyltoluene	NR	NR	NR	3	ND	ND	0.7 J	ND	ND	ND	1.7 J	ND	ND	ND	ND	ND		
4-Methyl-2-pentanone	NR	ND																
Acetone	NR	NR	9	5	9	22	16	8	22 J	10 J	ND	ND	ND	ND	5.6 J	ND		
alpha-Chlorotoluene	NR	NR	NR	ND	ND	ND	ND	0.5 J	ND									
Acrylonitrile	NR	NR	NR	ND	ND	ND	ND	0.4 J	ND	NR								
Benzene	NR	NR	NR	1	ND	ND	1	0.4 J	0.6 J	ND	ND	6.7 J	ND	ND	ND	ND		
Benzyl Chloride	NR	NR	NR	ND	ND	ND	ND	ND	NR									
Bromodichloromethane	NR	NR	NR	23	ND	ND	1	0.8 J	0.8 J	ND								
Bromoform	NR	NR	NR	ND	ND	ND	ND	1 J	ND									
Bromomethane	NR	NR	NR	ND	ND	ND	0.8	0.6 J	0.5 J	ND								
Carbon Disulfide	NR	NR	NR	ND	ND	ND	0.9	0.5 J	0.4 J	ND	ND	11 J	ND	ND	4.6 J	ND		
Carbon Tetrachloride	NR	NR	NR	2	ND	ND	2	1 J	1 J	ND								
Chlorobenzene	NR	NR	NR	ND	ND	ND	ND	0.5 J	ND	ND	20 J, B	ND	ND	ND	ND	ND		
Chlorodibromomethane	NR	NR	NR	ND	ND	ND	ND	0.9 J	NR									
Chloroethane	NR	NR	NR	ND	ND	ND	0.6	0.4 J	0.4 J	ND								
Chloroform	NR	NR	2	1	ND	1	0.8 J	0.6 J	ND									
Chloromethane	NR	NR	1	0.5	ND	1	1	1	7.1 J	ND								
cis-1,2-Dichloroethene	480	59	ND	9	15	3	0.7 J	ND	0.4 J	7.1 J	7.4 J	20 J	22 J	14 J	6.2 J	11 J		
cis-1,3-Dichloropropene	NR	NR	ND	ND	ND	0.7 J	ND											
Cumene	NR	ND																
Cyclohexane	NR	NR	NR	ND	ND	ND	0.9	0.7	0.3 J	ND								
Dichlorodifluoromethane	NR	NR	NR	3	2	ND	3	2	3	ND								
Diisopropyl ether	NR	NR	NR	ND	ND	ND	ND	6.9 J	5.3 J	19 J	47 J	ND	ND	ND	NR	NR		
Ethanol	NR	NR	5	4	2	10	7	3	6.9 J	5.3 J	19 J	47 J	ND	ND	ND	ND		
Ethyl Acetate	NR	NR	NR	ND	ND	ND	ND	ND	NR									
Ethyl tert-butyl ether	NR	NR	NR	ND	ND	ND	0.7 J	ND	ND	NR								
Ethylbenzene	NR	NR	NR	3	ND	ND	1	ND	0.5 J	ND	4.7 J	ND	ND	ND	ND	ND		
Freon 11	NR	ND	ND	ND	ND	ND	2.3 J	ND										
Freon 113	NR	NR	NR	ND	ND	ND	2	2 J	1 J	ND								
Freon 114	NR	NR	NR	ND	ND	ND	2	1 J	0.9 J	ND								
Freon 12	NR	ND																
Heptane	NR	NR	NR	ND	ND	ND	2	ND	0.5 J	ND								
Hexachlorobutadiene	NR	NR	NR	ND	ND	ND	2 J	ND	1 J	ND								
Hexane	NR	NR	NR	1	ND	ND	3	3	0.7	ND	ND	3.1 J	ND	ND	ND	ND		
Iso-Octane	NR	NR	NR	2	ND	ND	4	ND	0.6 J	NR								
Isopropylbenzene	NR	NR	NR	ND	ND	ND	0.8 J	ND	0.6 J	NR								
Isopropyl alcohol	NR	NR	NR	0.8	0.8	2	3	0.7	NR									
m,p-Xylene	NR	ND	1.8 J	12 J	ND	ND	ND	ND										
Methyl Methacrylate	NR	NR	NR	ND	ND	ND	0.6 J	ND	0.4 J	NR								
Methyl-tert-Butyl-Ether	NR	NR	NR	ND	ND	ND	1	1	0.4 J	ND								
Methylene Chloride	NR	NR	NR	1	4	8	17	2	2.3 J	ND	ND	10 J	ND	ND	ND	ND		
MIBK	NR	NR	NR	ND	ND	ND	1	ND	0.4 J	NR								
Naphthalene	NR	NR	NR	4	5	5	ND	ND	ND	NR								
n-Butane	NR	NR	0.8	0.7	ND	2	0.7	0.8	NR									
o-Xylene	NR	ND	6.3 J	ND	ND	ND	ND	ND										
p-Isopropyltoluene	NR	NR	NR	ND	ND	ND	0.6 J	ND	ND	NR								
n-Propylbenzene	NR	NR	NR	2	ND	ND	0.7 J	ND										
Propylene	NR	NR	NR	ND	2	2	ND	ND	0.5	NR								
Styrene	NR	NR	NR	ND	ND	ND	0.7 J	ND										
tert-Amyl methyl ether	NR	NR	NR	ND	ND	ND	ND	0.5 J	NR									
tert-Butyl Alcohol	NR	NR	NR	ND	ND	ND	0.7	0.4 J	0.4 J	NR								
Tetrachloroethene	1700	410	260	36	63	10	1	ND	2	48	46	93	120	80	49	79		
Tetrahydrofuran	NR	NR	4	2	2	1	1	0.5 J	ND									
Toluene	NR	NR	3	ND	ND	3	0.4 J	0.8	ND	ND	26	ND	ND	ND	ND	ND		
Total Xylenes	NR	NR	NR	13	ND	ND	4	ND	2 J	NR								
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	0.7 J	0.4 J	0.4 J	ND								
trans-1,3-Dichloropropene	NR	NR	NR	ND														
Trichloroethene	180000	18000	14000	1200	2400	560	1	0.6 J	0.6 J	4200	4300	7200	12000	8100	5200	5400		
Trichlorofluoromethane	NR	NR	2	1	ND	2	2	NR										
Vinyl Acetate	NR	NR	1	ND	ND	ND	0.7 J	ND	NR									
Vinyl Bromide	NR	NR	NR	ND	ND	ND	1	0.6 J	0.6 J	NR								
Vinyl Chloride	ND	ND	ND	ND	ND	ND	0.5 J	0.3 J	0.3 J	ND								

**Notes:**  
 $\mu\text{g}/\text{m}^3$  = micrograms per cubic meter  
NR = Not Recorded  
NA = Data not available  
ND = Not determined

**Table 5**  
**Soil Vapor Extraction Containment System**  
**Site 1, Former Drum Marshalling Yard**  
**Naval Weapons Industrial Reserve Plant - Bethpage, NY**  
**Quarterly Vapor Monitoring Results of SVE Wells**  
**Through Third Quarter 2013**

Sample ID	SVE 101D															
	12/21/09	03/31/10	06/09/10	09/16/10	12/22/10	03/30/11	06/28/11	09/06/11	10/14/11	02/10/12	05/11/12	09/11/12	12/05/12	01/15/13	05/16/13	08/27/13
<b>Analysis by TO-15 (<math>\mu\text{g}/\text{m}^3</math>)</b>																
1,1,1-Trichloroethane	26000	130	53	ND	ND	ND	3	8	0.8 J	ND	3.1 J	9.9	11	ND	ND	5.6
1,1,2,2-Tetrachloroethane	NR	NR	NR	ND	ND	ND	3	0.9 J	1 J	ND						
1,1,2-Trichloroethane	NR	NR	NR	ND	ND	ND	2	0.6 J	0.7 J	ND						
1,1-Dichloroethene	660	3.9	ND	ND	ND	ND	2	0.9 J	0.5 J	ND	ND	1.0 J	1.1 J	1.1 J	ND	ND
1,1-Dichloroethene	180	2	ND	ND	ND	ND	ND	0.7 J	0.4 J	ND						
1,2,2,3-Trichloropropane	NR	NR	NR	ND	ND	ND	2	0.8 J	0.8 J	NR						
1,2,2,3-Trimethylbenzene	NR	NR	NR	ND	ND	ND	4	1	1	NR						
1,2,4-Trichlorobenzene	NR	NR	NR	ND	ND	ND	2 J	ND	ND	ND	3.2 J	ND	2.7 J	ND	1.6 J	ND
1,2,4-Trimethylbenzene	NR	NR	NR	ND	ND	ND	10	3	3	ND	2.7 J	2.9 J	1.8 J	ND	0.85 J	1.3 J
1,2-Dibromoethane	NR	NR	NR	ND	ND	ND	3	ND	0.9 J	ND	0.72 J	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	NR	NR	NR	ND	ND	ND	2 J	ND	0.7 J	ND						
1,2-Dichloroethane	NR	0.5	ND	ND	ND	ND	2	0.5 J	0.5 J	ND						
1,2-Dichloropropane	NR	NR	NR	ND	ND	ND	2	0.6 J	0.5 J	ND						
1,3,5-Trimethylbenzene	NR	NR	NR	ND	ND	ND	3	0.9 J	1	ND	ND	0.68 J	ND	ND	ND	ND
1,3-Butadiene	NR	NR	NR	ND	ND	ND	0.4 J	0.5 J	ND							
1,3-Dichlorobenzene	NR	NR	NR	ND	ND	ND	1 J	ND								
1,4-Dichlorobenzene	NR	NR	NR	ND	ND	ND	1 J	ND	ND	ND	ND	0.89 J	0.34 J	ND	ND	ND
1,4-Dioxane	NR	NR	NR	ND	ND	ND	1	ND								
2,2,4-Trimethylpentane	NR	ND	ND	0.99 J	1.2 J	ND	ND	ND								
2-Butanone	NR	NR	NR	ND	1	2	8	1	1	ND	ND	2.2 J	2.2 J	ND	ND	ND
2-Hexanone	NR	NR	NR	ND	ND	2	0.7 J	0.5 J	ND							
2-Propanol	NR	ND	ND	ND	ND	5.5 J	ND	ND								
3-Chloro-1-propene	NR	NR	NR	ND	ND	ND	0.4 J	0.4 J	ND							
4-Ethyltoluene	NR	NR	NR	ND	ND	ND	3	0.8 J	1	ND	1.3 J	1.9 J	1.1 J	ND	0.46 J	0.90 J
4-Methyl-2-pentanone	NR	ND														
Acetone	NR	NR	NR	19	10	36	4	9	4.4 J	14 J	3.6 J	13 J	6.9 J	21	30	
alpha-Chlorotoluene	NR	NR	NR	ND	ND	ND	2 J	ND	0.5 J	ND	ND	0.49 J	ND	ND	ND	ND
Acrylonitrile	NR	NR	NR	ND	ND	ND	0.4 J	ND	NR							
Benzene	NR	NR	NR	ND	1	ND	4	0.5 J	0.5 J	0.59 J	ND	0.59 J	ND	0.41 J	1.2 J	0.48 J
Benzyl Chloride	NR	NR	NR	ND	ND	ND	ND	ND	ND	NR						
Bromodichloromethane	NR	NR	NR	ND	ND	ND	3	0.9 J	0.8 J	ND						
Bromoform	NR	NR	NR	ND	ND	ND	3 J	ND	1 J	ND						
Bromomethane	NR	NR	NR	ND	ND	ND	2	0.6 J	0.5 J	ND	ND	ND	ND	1.9 J	ND	ND
Carbon Disulfide	NR	NR	NR	ND	ND	ND	2	0.8	0.5 J	ND	ND	1.9 J	1.4 J	ND	1.5 J	ND
Carbon Tetrachloride	NR	NR	NR	ND	ND	ND	4	1 J	1	ND						
Chlorobenzene	NR	NR	NR	ND	ND	ND	2	0.5 J	0.6 J	ND	ND	2.5 J, B	ND	ND	ND	ND
Chlorodibromomethane	NR	NR	NR	ND	ND	ND	3	0.9 J	1 J	NR						
Chloroethane	NR	NR	NR	ND	ND	ND	0.4 J	0.4 J	ND							
Chloroform	NR	NR	NR	ND	ND	ND	2	0.7 J	ND	0.91 J	5.4	2.4 J	ND	ND	1.2 J	
Chloromethane	NR	NR	NR	1	2	ND	3	0.4	1	ND	ND	ND	ND	ND	ND	1.6 J
cis-1,2-Dichloroethene	220	8.5	7.5	ND	3	ND	2	2	0.5 J	ND	ND	2.1 J	3.2	ND	ND	ND
cis-1,3-Dichloropropene	NR	NR	NR	ND	ND	ND	2	0.5 J	ND							
Cumene	NR	ND														
Cyclohexane	NR	NR	NR	ND	ND	ND	2	0.4 J	0.4 J	ND						
Dichlorodifluoromethane	NR	NR	NR	2	3	ND	5	3	3	ND						
Diisopropyl ether	NR	NR	NR	14	ND	ND	ND	ND	ND	NR						
Ethanol	NR	NR	NR	7	5	11	29	1	3	2.4 J	3.2 J	2.9 J	4.6 J	2.7 J	6.4	64
Ethyl Acetate	NR	NR	NR	12	ND	ND	ND	0.5 J	ND	NR						
Ethyl tert-butyl ether	NR	NR	NR	ND	ND	ND	1	0.5 J	ND	NR						
Ethylbenzene	NR	NR	NR	ND	ND	ND	4	0.8 J	0.9	ND	ND	1.5 J	ND	ND	ND	ND
Freon 11	NR	1.2 J	1.7 J	1.5 J	2.2 J	2.2 J	1.4 J	3.0 J								
Freon 113	NR	NR	NR	4	2	ND	4	7	1 J	ND	ND	3.4 J	4.4 J	3.7 J	ND	2.8 J
Freon 114	NR	NR	NR	ND	ND	ND	3	1 J	1 J	ND						
Freon 12	NR	1.4 J	2.6 J	2.6 J	2.4 J	2.5 J	2.5 J	2.3 J								
Heptane	NR	NR	NR	ND	ND	ND	3	0.4 J	0.5 J	ND						
Hexachlorobutadiene	NR	NR														

**Table 5**  
**Soil Vapor Extraction Containment System**  
**Site 1, Former Drum Marshalling Yard**  
**Naval Weapons Industrial Reserve Plant - Bethpage, NY**  
**Quarterly Vapor Monitoring Results of SVE Wells**  
**Through Third Quarter 2013**

Sample ID	SVE 102I															
	12/21/09	03/31/10	06/09/10	09/16/10	12/22/10	03/30/11	06/28/11	09/06/11	10/14/11	02/10/12	05/11/12	09/11/12	12/05/12	01/15/13	05/16/13	08/27/13
<b>Analysis by TO-15 (<math>\mu\text{g}/\text{m}^3</math>)</b>																
1,1,1-Trichloroethane	ND	ND	13	3	ND	NA	2	3	2	ND	0.60 J	3.3 J	ND	ND	ND	1.6 J
1,1,2,2-Tetrachloroethane	NR	NR	NR	ND	ND	NA	1 J	0.8 J	0.8 J	ND						
1,1,2-Trichloroethane	NR	NR	NR	ND	ND	NA	1 J	0.6 J	0.6 J	ND						
1,1-Dichloroethene	ND	ND	ND	ND	ND	NA	0.8 J	0.5 J	0.5 J	ND						
1,2,3-Trichloropropane	NR	NR	NR	ND	ND	NA	1 J	0.6 J	0.8 J	NR						
1,2,3-Trimethylbenzene	NR	NR	NR	10	ND	NA	5	1	2	NR						
1,2,4-Trichlorobenzene	NR	NR	NR	ND	ND	NA	1 J	ND								
1,2,4-Trimethylbenzene	NR	NR	NR	35	1	NA	18	3	5	0.77 J	1.5 J	2.3 J	ND	0.96 J	1.2 J	1.0 J
1,2-Dibromoethane	NR	NR	NR	ND	ND	NA	1 J	ND	0.8 J	ND						
1,2-Dichlorobenzene	NR	NR	NR	ND	ND	NA	0.8 J	ND	ND	ND	1.0 J	ND	ND	ND	ND	ND
1,2-Dichloroethane	NR	ND	ND	ND	NA	0.8	0.4 J	0.4 J	ND							
1,2-Dichloropropane	NR	NR	NR	ND	ND	NA	0.9 J	0.6 J	0.6 J	ND						
1,3,5-Trimethylbenzene	NR	NR	NR	7	ND	NA	4	0.8 J	1	ND	0.89 J	ND	ND	ND	ND	ND
1,3-Butadiene	NR	NR	NR	ND	ND	NA	0.3 J	ND								
1,3-Dichlorobenzene	NR	NR	NR	ND	ND	NA	0.7 J	ND								
1,4-Dichlorobenzene	NR	NR	NR	ND	ND	NA	0.6 J	ND	ND	ND	1.2 J	0.78 J	ND	ND	ND	ND
1,4-Dioxane	NR	NR	NR	ND	ND	NA	0.8	ND	0.4 J	ND						
2,2,4-Trimethylpentane	NR	ND														
2-Butanone	NR	NR	NR	ND	1	NA	4	1	2	ND	ND	ND	ND	ND	4.7 J	ND
2-Hexanone	NR	NR	NR	ND	ND	NA	0.9	0.6 J	0.5 J	ND						
2-Propanol	NR	ND	ND	ND	ND	1.5 J	ND	ND								
3-Chloro-1-propene	NR	NR	NR	ND	ND	NA	0.6 J	ND								
4-Ethyltoluene	NR	NR	NR	5	ND	NA	4	0.8 J	1	0.64 J	0.72 J	3.2 J	ND	0.41 J	0.66 J	ND
4-Methyl-2-pentanone	NR	ND														
Acetone	NR	NR	NR	6	5	NA	14	4	7	7.8	9.9 J	7.2 J	12 J	8.7 J	21	9.7 J
alpha-Chlorotoluene	NR	NR	NR	ND	ND	NA	0.7 J	ND	ND	ND	ND	0.41 J	ND	ND	ND	ND
Acrylonitrile	NR	NR	NR	ND	ND	NA	0.5	0.4 J	ND	NR						
Benzene	NR	NR	NR	ND	ND	NA	1	0.4 J	0.5 J	ND	ND	0.45 J	1.2 J	ND	ND	ND
Benzyl Chloride	NR	NR	NR	ND	ND	NA	ND	ND	NR							
Bromodichloromethane	NR	NR	NR	ND	ND	NA	2	0.8 J	0.7 J	ND						
Bromoform	NR	NR	NR	ND	ND	NA	1 J	ND	1 J	ND						
Bromomethane	NR	NR	NR	ND	ND	NA	0.8	0.5 J	0.5 J	ND						
Carbon Disulfide	NR	NR	NR	ND	ND	NA	0.7	0.5 J	0.4 J	ND	ND	1.8 J	1.5 J	ND	10	ND
Carbon Tetrachloride	NR	NR	NR	ND	ND	NA	2	1 J	1 J	ND						
Chlorobenzene	NR	NR	NR	ND	ND	NA	0.9	ND	0.5 J	ND	ND	2.7 J, B	ND	ND	ND	ND
Chlorodibromomethane	NR	NR	NR	ND	ND	NA	1 J	ND	0.9 J	NR						
Chloroethane	NR	NR	NR	ND	ND	NA	0.6	0.4 J	0.3 J	ND						
Chloroform	NR	NR	NR	4	ND	NA	3	5	4	0.75 J	1.4 J	6.6	ND	ND	1.4 J	3.7 J
Chloromethane	NR	NR	NR	ND	0.9	NA	1	0.4	0.4	ND						
cis-1,2-Dichloroethene	ND	ND	ND	ND	NA	0.7 J	0.5 J	0.5 J	ND							
cis-1,3-Dichloropropene	NR	NR	NR	ND	ND	NA	0.7 J	ND								
Cumene	NR	ND														
Cyclohexane	NR	NR	NR	ND	ND	NA	0.6 J	ND	0.4 J	ND						
Dichlorodifluoromethane	NR	NR	NR	2	ND	NA	3	2	2	ND						
Diisopropyl ether	NR	NR	NR	ND	ND	NA	ND	ND	NR							
Ethanol	NR	NR	NR	2	3	NA	8	2	4	3.0 J	ND	ND	ND	3.6 J	6.5	ND
Ethyl Acetate	NR	NR	NR	ND	ND	NA	ND	ND	NR							
Ethyl tert-butyl ether	NR	NR	NR	ND	ND	NA	0.7 J	ND	ND	NR						
Ethylbenzene	NR	NR	NR	3	ND	NA	4	0.8 J	1	ND	ND	1.4 J	ND	0.70 J	ND	ND
Freon 11	NR	1.1 J	2.0 J	2.5 J	1.4 J	1.8 J	2.1 J	ND								
Freon 113	NR	NR	NR	ND	ND	NA	2	1 J	1 J	ND						
Freon 114	NR	NR	NR	ND	ND	NA	2	1 J	1 J	ND						
Freon 12	NR	1.9 J	2.4 J	2.6 J	2.3 J	2.4 J	2.5 J	2.4 J								
Heptane	NR	NR	NR	ND	ND	NA	1	ND	0.5 J	ND	ND	0.83 J	ND	ND	ND	ND
Hexachlorobutadiene	NR	NR	NR	ND	ND	NA	3	1 J	1 J	ND						
Hexane	NR	NR	NR	ND	1	NA	1	0.8	0.8	ND	ND	0.36 J	ND			

**Table 5**  
**Soil Vapor Extraction Containment System**  
**Site 1, Former Drum Marshalling Yard**  
**Naval Weapons Industrial Reserve Plant - Bethpage, NY**  
**Quarterly Vapor Monitoring Results of SVE Wells**  
**Through Third Quarter 2013**

Sample ID	SVE 102D															
	12/21/09	03/31/10	06/09/10	09/16/10	12/08/10	03/30/11	06/28/11	09/06/11	10/14/11	02/10/12	05/11/12	09/11/12	12/05/12	01/15/13	05/16/13	08/27/13
<b>Analysis by TO-15 (<math>\mu\text{g}/\text{m}^3</math>)</b>																
1,1,1-Trichloroethane	130	53	14	7	2	2	6	4	5	1.4 J	1.2 J	3.9 J	ND	ND	ND	2.3 J
1,1,2,2-Tetrachloroethane	NR	NR	NR	ND	ND	ND	1 J	0.9 J	1 J	ND						
1,1,2-Trichloroethane	NR	NR	NR	ND	ND	ND	1	0.6 J	0.8 J	ND						
1,1-Dichloroethene	ND	2.7	ND	ND	ND	ND	1	0.6 J	0.7 J	ND	ND	0.51 J	0.95 J	ND	ND	ND
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	1	0.6 J	0.6 J	ND						
1,2,2,3-Trichloropropane	NR	NR	NR	ND	ND	ND	ND	0.7 J	0.9 J	NR						
1,2,2,3-Trimethylbenzene	NR	NR	NR	5	ND	ND	7	1	2	NR						
1,2,4-Trichlorobenzene	NR	NR	NR	ND	ND	ND	2 J	0.8 J	ND							
1,2,4-Trimethylbenzene	NR	NR	NR	18	2	2	22	4	6	ND	2.3 J	2.8 J	0.79 J	ND	ND	ND
1,2-Dibromoethane	NR	NR	NR	ND	ND	ND	1 J	ND	1 J	ND						
1,2-Dichlorobenzene	NR	NR	NR	ND	ND	ND	1 J	ND	0.8 J	ND						
1,2-Dichloroethane	NR	ND	ND	ND	ND	ND	0.9	0.5 J	0.5 J	ND						
1,2-Dichloropropane	NR	NR	NR	ND	ND	ND	1	0.6 J	0.6 J	ND						
1,3,5-Trimethylbenzene	NR	NR	NR	4	ND	ND	4	ND	1	ND						
1,3-Butadiene	NR	NR	NR	1	ND	ND	ND	0.3 J	0.4 J	ND						
1,3-Dichlorobenzene	NR	NR	NR	ND	ND	ND	0.8 J	ND	0.7 J	ND	ND	1.2 J	ND	ND	ND	ND
1,4-Dichlorobenzene	NR	NR	NR	ND	ND	ND	0.8 J	ND	0.6 J	ND	ND	1.3 J	0.60 J	ND	ND	ND
1,4-Dioxane	NR	NR	NR	ND	ND	ND	1	ND	0.6 J	ND						
2,2,4-Trimethylpentane	NR	ND	ND	0.53 J	0.35 J	ND	1.2 J	ND								
2-Butanone	NR	NR	NR	4	0.9	0.7	5	1	1	ND	ND	3.7 J	ND	ND	ND	ND
2-Hexanone	NR	NR	NR	ND	ND	ND	0.9 J	0.6 J	0.6 J	ND						
2-Propanol	NR	ND														
3-Chloro-1-propene	NR	NR	NR	ND	ND	ND	0.7 J	0.4 J	ND							
4-Ethyltoluene	NR	NR	NR	3	ND	ND	4	1	1	0.36 J	1.0 J	2.1 J	ND	0.67 J	ND	ND
4-Methyl-2-pentanone	NR	ND														
Acetone	NR	NR	NR	10	8	6	12	4	4	8.4	6.0 J	7.1 J	5.7 J	4.6 J	21	3.4 J
alpha-Chlorotoluene	NR	NR	NR	ND	ND	ND	0.9 J	ND	0.6 J	ND	ND	0.78 J	ND	ND	ND	ND
Acrylonitrile	NR	NR	NR	ND	ND	ND	0.5	0.4 J	ND	NR						
Benzene	NR	NR	NR	ND	ND	ND	1	0.5 J	0.9	ND	ND	ND	0.55 J	1.2 J	ND	ND
Benzyl Chloride	NR	NR	NR	ND	ND	ND	ND	ND	ND	NR						
Bromodichloromethane	NR	NR	NR	ND	ND	ND	2	0.9 J	1 J	ND						
Bromoform	NR	NR	NR	ND	ND	ND	2 J	ND	1 J	ND						
Bromomethane	NR	NR	NR	ND	ND	ND	1	0.6 J	0.5 J	ND	ND	ND	2.0 J	ND	ND	ND
Carbon Disulfide	NR	NR	NR	ND	ND	ND	0.9	0.5 J	0.5 J	ND	ND	2.0 J	2.5 J	ND	1.4 J	ND
Carbon Tetrachloride	NR	NR	NR	ND	ND	ND	2	2	2	ND						
Chlorobenzene	NR	NR	NR	ND	ND	ND	1 J	ND	0.7 J	ND	ND	3.3 J, B	ND	ND	ND	ND
Chlorodibromomethane	NR	NR	NR	ND	ND	ND	2 J	0.9 J	1 J	NR						
Chloroethane	NR	NR	NR	ND	ND	ND	0.7	0.4 J	0.4 J	ND						
Chloroform	NR	NR	NR	11	2	3	9	14	17	19	19	23	11	ND	ND	21
Chloromethane	NR	NR	NR	ND	1	0.6	1	0.4	0.4	ND						
cis-1,2-Dichloroethene	ND	1.4	ND	ND	0.9	ND	1	0.5 J	0.9	ND	ND	1.1 J	4.1	ND	ND	ND
cis-1,3-Dichloropropene	NR	NR	NR	ND	ND	ND	0.9 J	ND	0.6 J	ND	ND	0.69 J	ND	ND	ND	ND
Cumene	NR	ND														
Cyclohexane	NR	NR	NR	ND	ND	ND	0.7 J	0.5 J	0.4 J	ND						
Dichlorodifluoromethane	NR	NR	NR	2	3	2	4	3	3	ND						
Diisopropyl ether	NR	NR	NR	ND	ND	ND	ND	ND	ND	NR						
Ethanol	NR	NR	NR	5	3	4	3	1	1	ND	ND	ND	5.5 J	ND	ND	ND
Ethyl Acetate	NR	NR	NR	ND	ND	ND	ND	ND	ND	NR						
Ethyl tert-butyl ether	NR	NR	NR	ND	ND	ND	0.8 J	0.4 J	0.5 J	NR						
Ethylbenzene	NR	NR	NR	3	ND	ND	4	ND	1	ND	ND	0.65 J	ND	ND	ND	ND
Freon 11	NR	4.8	5.8	11	6.6	1.5 J	1.4 J	4.4 J								
Freon 113	NR	NR	NR	ND	ND	ND	3	2	2	ND	ND	ND	1.9 J	ND	ND	ND
Freon 114	NR	NR	NR	ND	ND	ND	2	1 J	1 J	ND						
Freon 12	NR	2.6 J	2.1 J	2.1 J	2.2 J	2.6 J	2.1 J	2.3 J								
Heptane	NR	NR	NR	ND	ND	ND	1	0.4 J	0.6 J	ND						
Hexachlorobutadiene	NR	NR	NR	ND	ND	ND	3	1 J	2 J	ND						

**Table 5**  
**Soil Vapor Extraction Containment System**  
**Site 1, Former Drum Marshalling Yard**  
**Naval Weapons Industrial Reserve Plant - Bethpage, NY**  
**Quarterly Vapor Monitoring Results of SVE Wells**  
**Through Third Quarter 2013**

### **Notes:**

**Notes:**

$\mu\text{g}/\text{m}^3$  = microgram  
NR = Not Recorded

NR = Not Recorded

NA = Data not available

ND = Not detected above method

ND = Not detected  
detection limit

**Table 5**  
**Soil Vapor Extraction Containment System**  
**Site 1, Former Drum Marshalling Yard**  
**Naval Weapons Industrial Reserve Plant - Bethpage, NY**  
**Quarterly Vapor Monitoring Results of SVE Wells**  
**Through Third Quarter 2013**

Sample ID	SVE 103D																
	12/21/09	03/31/10	06/09/10	09/16/10	12/08/10	03/30/11	06/28/11	09/06/11	10/14/11	02/10/12	05/11/12	09/11/12	12/05/12	01/15/13	05/16/13	08/27/13	
<b>Analysis by TO-15 (<math>\mu\text{g}/\text{m}^3</math>)</b>																	
1,1,1-Trichloroethane	3000	1100	230	ND	13	ND	2 J	20	31	7.4 J	6.9 J	22	190	ND	150	170	
1,1,2,2-Tetrachloroethane	NR	NR	NR	ND	ND	ND	2 J	2 J	12 J	ND							
1,1,2-Trichloroethane	NR	NR	NR	ND	ND	2	2	1 J	4	9	1.6 J	1.5 J	1.9 J	10 J	ND	10	10 J
1,1-Dichloroethene	82	69	ND	ND	2	2	1 J	2	6 J	ND							
1,2,3-Trichloropropane	NR	NR	NR	ND	ND	ND	2 J	2 J	11 J	NR							
1,2,3-Trimethylbenzene	NR	NR	NR	5	ND	2	4	ND	7 J	NR							
1,2,4-Trichlorobenzene	NR	NR	NR	ND	ND	ND	ND	ND	9 J	ND	ND	ND	ND	ND	3.2 J	ND	
1,2,4-Trimethylbenzene	NR	NR	NR	8	2	7	12	ND	9 J	ND	2.4 J	3.2 J	ND	ND	ND	ND	
1,2-Dibromoethane	NR	NR	NR	ND	ND	ND	2 J	2 J	11 J	ND							
1,2-Dichlorobenzene	NR	NR	NR	ND	ND	ND	ND	ND	9 J	ND							
1,2-Dichloroethane	NR	ND	ND	ND	ND	ND	1 J	1 J	6 J	ND							
1,2-Dichloropropane	NR	NR	NR	ND	ND	ND	1 J	1 J	8 J	ND							
1,3,5-Trimethylbenzene	NR	NR	NR	ND	ND	2	3	ND	8 J	ND							
1,3-Butadiene	NR	NR	NR	ND	ND	1	0.8 J	ND									
1,3-Dichlorobenzene	NR	NR	NR	ND	ND	ND	ND	ND	8 J	ND							
1,4-Dichlorobenzene	NR	NR	NR	ND	ND	ND	ND	ND	8 J	ND	2.6 J	ND	ND	ND	ND	ND	
1,4-Dioxane	NR	NR	NR	ND	ND	ND	0.9 J	1	6 J	ND							
2,2,4-Trimethylpentane	NR	ND	2.1 J	ND	ND	ND	ND	ND									
2-Butanone	NR	NR	NR	4	1	4	5	2	6 J	ND							
2-Hexanone	NR	NR	NR	ND	ND	1 J	1 J	5 J	ND								
2-Propanol	NR	ND	5.5 J	ND	ND	ND	ND	ND									
3-Chloro-1-propene	NR	NR	NR	ND	ND	0.8 J	1 J	4 J	ND								
4-Ethyltoluene	NR	NR	NR	ND	ND	ND	3	ND	8 J	ND	1.2 J	ND	ND	ND	ND	ND	
4-Methyl-2-pentanone	NR	ND															
Acetone	NR	NR	NR	10	6	21	19	9	10	13 J	11 J	10 J	7.0 J	8.0 J	12 J	ND	
alpha-Chlorotoluene	NR	NR	NR	ND	ND	ND	ND	ND	8 J	ND							
Acrylonitrile	NR	NR	NR	ND	ND	0.5 J	0.8 J	ND	NR								
Benzene	NR	NR	NR	ND	ND	12	1	1 J	6 J	ND	ND	ND	0.76 J	ND	ND	ND	
Benzyl Chloride	NR	NR	NR	ND	ND	ND	ND	ND	ND	NR							
Bromodichloromethane	NR	NR	NR	ND	ND	ND	2 J	2 J	ND								
Bromoform	NR	NR	NR	ND	ND	ND	ND	2 J	14 J	ND							
Bromomethane	NR	NR	NR	ND	ND	ND	1 J	1 J	6 J	ND							
Carbon Disulfide	NR	NR	NR	ND	ND	1 J	1 J	6 J	ND	ND	5.4 J	ND	ND	2.4 J	ND	ND	
Carbon Tetrachloride	NR	NR	NR	ND	ND	ND	2 J	2 J	12 J	ND							
Chlorobenzene	NR	NR	NR	ND	ND	ND	1 J	1 J	8 J	ND	ND	11 J, B	ND	ND	ND	ND	
Chlorodibromomethane	NR	NR	NR	ND	ND	ND	2 J	2 J	14 J	NR							
Chloroethane	NR	NR	NR	ND	ND	0.9 J	1 J	5 J	ND								
Chloroform	NR	NR	NR	ND	1	ND	1 J	6	29	3.6 J	1.6	9.3 J	ND	ND	1.7 J	ND	
Chloromethane	NR	NR	NR	3	0.7	1	2	0.9	4 J	ND							
cis-1,2-Dichloroethene	420	1500	370	ND	92	ND	1 J	360	160	290	230	300	750	ND	550	700	
cis-1,3-Dichloropropene	NR	NR	NR	ND	ND	ND	ND	1 J	6 J	ND							
Cumene	NR	ND															
Cyclohexane	NR	NR	NR	ND	ND	5	1 J	0.9 J	5 J	ND							
Dichlorodifluoromethane	NR	NR	NR	6	2	2	4	3	10	ND							
Diisopropyl ether	NR	NR	NR	5	ND	ND	ND	1 J	6 J	NR							
Ethanol	NR	NR	NR	6	5	56	10	2	9	5.5 J	ND	ND	ND	3.8 J	ND	ND	
Ethyl Acetate	NR	NR	NR	5	ND	ND	ND	ND	ND	NR							
Ethyl tert-butyl ether	NR	NR	NR	ND	ND	1 J	1 J	5 J	NR								
Ethylbenzene	NR	NR	NR	ND	ND	8	3	0.9 J	7 J	ND	ND	2.3 J	ND	ND	ND	ND	
Freon 11	NR	ND	3.1 J	ND	1.1 J	1.4 J	ND	ND									
Freon 113	NR	NR	NR	ND	10	10	3 J	12	20	ND	ND	ND	68	ND	39	35	
Freon 114	NR	NR	NR	ND	ND	ND	2 J	2 J	12 J	ND							
Freon 12	NR	ND	2.9 J	ND	2.7 J	2.6 J	ND	ND									
Heptane	NR	NR	NR	ND	ND	8	1 J	1 J	5 J	ND							
Hexachlorobutadiene	NR	NR	NR	ND	ND	4 J	3 J	18 J	ND								
Hexane	NR	NR	NR	3	1	20	2	3	6 J	ND							
iso-Octane	NR	NR	NR	ND	ND	1 J	1 J	8 J									

**Table 5**  
**Soil Vapor Extraction Containment System**  
**Site 1, Former Drum Marshalling Yard**  
**Naval Weapons Industrial Reserve Plant - Bethpage, NY**  
**Quarterly Vapor Monitoring Results of SVE Wells**  
**Through Third Quarter 2013**

Sample ID	SVE 104I															
	12/21/09	03/31/10	06/09/10	09/16/10	12/08/10	03/30/11	06/28/11	09/06/11	10/14/11	02/10/12	05/11/12	09/11/12	12/05/12	01/15/13	05/16/13	08/27/13
<b>Analysis by TO-15 (<math>\mu\text{g}/\text{m}^3</math>)</b>																
1,1,1-Trichloroethane	730	4.2	ND	4	NR	NA	1J	4	2	ND	ND	8.3	ND	ND	ND	3.1J
1,1,2,2-Tetrachloroethane	NR	NR	NR	ND	ND	NA	1J	0.7J	ND							
1,1,2-Trichloroethane	NR	NR	NR	ND	ND	NA	1J	0.6J	0.5J	ND						
1,1-Dichloroethene	24	0.54	ND	ND	ND	NA	1J	ND								
1,2-Dichloroethene	ND	ND	ND	ND	ND	NA	1J	ND								
1,2,2,3-Trichloropropane	NR	NR	NR	ND	ND	NA	1J	ND	ND	NR						
1,2,2,3-Trimethylbenzene	NR	NR	NR	4	ND	NA	ND	ND	0.7J	NR						
1,2,4-Trichlorobenzene	NR	NR	NR	ND	ND	NA	ND									
1,2,4-Trimethylbenzene	NR	NR	NR	ND	ND	NA	ND									
1,3-Butadiene	NR	NR	NR	ND	ND	NA	1	0.4J	ND	ND	ND	2.2J	ND	ND	ND	ND
1,3-Dichlorobenzene	NR	NR	NR	ND	ND	NA	ND									
1,4-Dichlorobenzene	NR	NR	NR	ND	ND	NA	ND									
1,4-Dioxane	NR	NR	NR	ND	ND	NA	0.8J	0.4J	ND							
2,2,4-Trimethylpentane	NR	ND	ND	ND	ND	ND	1.1J	ND								
2-Butanone	NR	NR	NR	3	0.6	NA	3	1	0.8	ND						
2-Hexanone	NR	NR	NR	ND	ND	NA	0.9J	ND								
2-Propanol	NR	ND	ND	ND	ND	ND	1.9J	ND								
3-Chloro-1-propene	NR	NR	NR	ND	ND	NA	0.9	0.3J	ND							
4-Ethyltoluene	NR	NR	NR	2	ND	NA	ND	ND	ND	ND	ND	1.9J	ND	ND	0.43J	ND
4-Methyl-2-pentanone	NR	ND														
Acetone	NR	NR	NR	11	3	NA	21	5	5	4.8J	6.5J	6.5J	8.4J	5.9J	13J	12J
alpha-Chlorotoluene	NR	NR	NR	ND	ND	NA	ND									
Acrylonitrile	NR	NR	NR	ND	ND	NA	0.6J	0.3J	ND	NR						
Benzene	NR	NR	NR	1	ND	NA	1J	0.4J	0.4J	ND	ND	0.66J	0.53J	1.1J	ND	ND
Benzyl Chloride	NR	NR	NR	ND	ND	NA	ND	ND	ND	NR						
Bromodichloromethane	NR	NR	NR	ND	ND	NA	2J	0.8J	ND							
Bromoform	NR	NR	NR	ND	ND	NA	ND									
Bromomethane	NR	NR	NR	ND	ND	NA	1J	0.4J	ND	ND	ND	1.9J	ND	ND	ND	ND
Carbon Disulfide	NR	NR	NR	ND	ND	NA	1J	0.5J	0.5J	ND	ND	5.2J	ND	ND	1.1J	ND
Carbon Tetrachloride	NR	NR	NR	ND	ND	NA	2J	1J	1J	ND						
Chlorobenzene	NR	NR	NR	ND	ND	NA	1J	0.5J	ND	ND	ND	2.3J, B	ND	ND	ND	ND
Chlorodibromomethane	NR	NR	NR	ND	ND	NA	2J	ND	NR							
Chloroethane	NR	NR	NR	ND	ND	NA	0.9J	0.3J	ND							
Chloroform	NR	NR	NR	2	ND	NA	1J	3	1	ND	ND	2.8J	ND	ND	ND	ND
Chloromethane	NR	NR	NR	ND	0.5	NA	2	0.5	0.8	ND						
cis-1,2-Dichloroethene	110	14	ND	2	0.8	NA	0.9J	2	3	0.90J	ND	5.0	ND	2.7J	ND	3.3
cis-1,3-Dichloropropene	NR	NR	NR	ND	ND	NA	1J	ND								
Cumene	NR	ND														
Cyclohexane	NR	NR	NR	0.8	ND	NA	1J	ND								
Dichlorodifluoromethane	NR	NR	NR	2	2	NA	3	2	2	ND						
Diisopropyl ether	NR	NR	NR	5	ND	NA	ND	ND	ND	NR						
Ethanol	NR	NR	NR	19	1	NA	12	2	3	ND	1.2J	ND	4.2J	ND	7.0	ND
Ethyl Acetate	NR	NR	NR	5	ND	NA	ND	ND	ND	NR						
Ethyl tert-butyl ether	NR	NR	NR	ND	ND	NA	1J	ND	ND	NR						
Ethylbenzene	NR	NR	NR	2	ND	NA	1J	0.6J	0.6J	ND	ND	0.89J	ND	ND	ND	ND
Freon 11	NR	1.2J	1.0J	1.6J	1.3J	1.2J	1.6J	1.0J	ND							
Freon 113	NR	NR	NR	ND	ND	NA	3J	2	2	ND	ND	3.0J	ND	3.6J	ND	2.3J
Freon 114	NR	NR	NR	ND	ND	NA	2J	0.9J	0.7J	ND						
Freon 12	NR	2.4J	2.1J	2.6J	2.5J	2.6J	2.9J	2.4J	ND							
Heptane	NR	NR	NR	1	ND	NA	1J	ND	ND	ND	ND	ND	2.6J	ND	ND	ND
Hexachlorobutadiene	NR	NR	NR	ND	ND	NA	2J	ND								
Hexane	NR	NR	NR	10	ND	NA	12	0.5J	0.4J	0.82J	ND	ND	3.4	ND	0.89J	ND
iso-Octane	NR	NR	NR	ND	ND	NA	1J	0.5J	0.5J	NR						
Isopropylbenzene	NR	NR	NR	ND	ND	NA	1J	ND	ND	NR						
Isopropyl alcohol	NR	NR	NR	6	ND	NA	7	0.7	0.5	NR						
m,p-Xylene	NR	NR	NR	NR	NR	NA	NR	NR	NR	ND	ND	2.4J	ND	3.1J	1.8J	ND
Methyl Methacrylate	NR	NR	NR	ND	ND	NA	0.9J</td									

**Table 5**  
**Soil Vapor Extraction Containment System**  
**Site 1, Former Drum Marshalling Yard**  
**Naval Weapons Industrial Reserve Plant - Bethpage, NY**  
**Quarterly Vapor Monitoring Results of SVE Wells**  
**Through Third Quarter 2013**

Sample ID	SVE 104D															
	12/21/09	03/31/10	06/09/10	09/16/10	12/22/10	03/30/11	06/28/11	09/06/11	10/14/11	02/10/12	05/11/12	09/11/12	12/05/12	01/15/13	05/16/13	08/27/13
<b>Analysis by TO-15 (<math>\mu\text{g}/\text{m}^3</math>)</b>																
1,1,1-Trichloroethane	3600	3000	860	ND	270	ND	370	620	440	520	580	620	920	820	0.89 J	500
1,1,2,2-Tetrachloroethane	NR	NR	NR	ND	ND	ND	1 J	ND	9 J	ND						
1,1,2-Trichloroethane	NR	NR	NR	ND	ND	66	ND	56	110	77	87	95	100	190	160	ND
1,1-Dichloroethene	290	350	140	ND	66	ND	2 J	7 J	7 J	ND	ND	ND	ND	ND	ND	95
1,2,3-Trichloropropane	NR	NR	NR	ND	ND	ND	2 J	7 J	7 J	NR						
1,2,3-Trimethylbenzene	NR	NR	NR	ND	ND	ND	7	ND	6 J	NR						
1,2,4-Trichlorobenzene	NR	NR	NR	ND	1.7 J	ND										
1,2,4-Trimethylbenzene	NR	NR	NR	ND												
1,3-Butadiene	NR	NR	NR	ND	ND	ND	3 J	ND								
1,3-Dichlorobenzene	NR	NR	NR	ND	ND	ND	1 J	ND	7 J	ND						
1,4-Dichlorobenzene	NR	NR	NR	ND	ND	ND	1 J	5 J	5 J	ND						
1,4-Dioxane	NR	NR	NR	ND	ND	ND	2	9	4 J	ND						
2,2,4-Trimethylpentane	NR	ND														
2-Butanone	NR	NR	NR	ND	ND	ND	7	5 J	3 J	ND	ND	ND	ND	ND	3.1 J	ND
2-Hexanone	NR	NR	NR	ND	ND	ND	1 J	8	ND							
2-Propanol	NR	ND														
3-Chloro-1-propene	NR	NR	NR	ND	ND	ND	1 J	4 J	ND							
4-Ethyltoluene	NR	NR	NR	ND	ND	ND	4	ND	5 J	ND	1.7 J	ND	ND	1.0 J	ND	ND
4-Methyl-2-pentanone	NR	ND														
Acetone	NR	NR	NR	10	ND	6	26	10	8	46	12 J	ND	7.4 J	ND	30	6.4 J
alpha-Chlorotoluene	NR	NR	NR	ND	ND	ND	1 J	ND	5 J	ND						
Acrylonitrile	NR	NR	NR	ND	ND	0.8 J	4	ND	NR							
Benzene	NR	NR	NR	ND	ND	ND	2	4 J	4 J	ND	ND	1.5 J	ND	ND	1.2 J	ND
Benzyl Chloride	NR	NR	NR	ND	ND	ND	1 J	ND	ND	NR						
Bromodichloromethane	NR	NR	NR	ND	ND	ND	2 J	8 J	7 J	ND						
Bromoform	NR	NR	NR	ND	ND	ND	3 J	ND	11 J	ND						
Bromomethane	NR	NR	NR	ND	ND	ND	1 J	6 J	5 J	ND						
Carbon Disulfide	NR	NR	NR	ND	ND	ND	1	5 J	4 J	ND	ND	6.3 J	ND	ND	1.2 J	ND
Carbon Tetrachloride	NR	NR	NR	ND	ND	ND	3	9 J	8 J	ND						
Chlorobenzene	NR	NR	NR	ND	ND	ND	1 J	ND	5 J	ND	ND	10 J, B	ND	ND	ND	ND
Chlorodibromomethane	NR	NR	NR	ND	ND	ND	2 J	9 J	10 J	NR						
Chloroethane	NR	NR	NR	ND	ND	ND	1 J	4 J	4 J	ND						
Chloroform	NR	NR	NR	ND	ND	ND	3	10	9 J	ND	2.2 J	5.8 J	ND	ND	ND	12
Chloromethane	NR	NR	NR	0.9	ND	ND	2	3 J	3 J	ND						
cis-1,2-Dichloroethene	2400	6600	3500	ND	1200	ND	1000	3600	2100	2200	2800 J	2200	4200	3700	8.6	2000
cis-1,3-Dichloropropene	NR	NR	NR	ND	ND	ND	1 J	ND								
Cumene	NR	ND														
Cyclohexane	NR	NR	NR	ND	ND	ND	2	4 J	ND							
Dichlorodifluoromethane	NR	NR	NR	2	ND	ND	4	9 J	8 J	ND						
Diisopropyl ether	NR	NR	NR	ND	ND	ND	ND	ND	ND	NR						
Ethanol	NR	NR	NR	4	4	6	20	10	ND	11 J	2.2 J	ND	ND	ND	6.9	ND
Ethyl Acetate	NR	NR	NR	ND	ND	ND	ND	6 J	ND	NR						
Ethyl tert-butyl ether	NR	NR	NR	ND	ND	ND	1 J	4 J	ND	NR						
Ethylbenzene	NR	NR	NR	ND	ND	ND	4	ND	5 J	ND	ND	2.3 J	ND	ND	0.64 J	ND
Freon 11	NR	ND	ND	ND	ND	0.95 J	ND	ND								
Freon 113	NR	NR	NR	ND	560	560	280	260	550	720	980	880	1900	1500	ND	1000
Freon 114	NR	NR	NR	ND	ND	ND	2 J	10 J	9 J	ND						
Freon 12	NR	ND	2.7 J	ND	3.2 J	2.2 J	2.6 J	ND								
Heptane	NR	NR	NR	ND	ND	ND	2	5 J	5 J	ND	ND	ND	ND	ND	0.76 J	ND
Hexachlorobutadiene	NR	NR	NR	ND	ND	ND	5	ND	14 J	ND						
Hexane	NR	NR	NR	2	ND	2	7	5 J	4 J	ND	ND	ND	ND	1.6 J	ND	ND
iso-Octane	NR	NR	NR	ND	ND	ND	3	7 J	6 J	NR						
Isopropylbenzene	NR	NR	NR	ND	ND	ND	2 J	ND	6 J	NR						
Isopropyl alcohol	NR	NR	NR	1	ND	ND	7	6	4 J	NR						
m,p-Xylene	NR	ND	1.1 J	3.8 J	ND	1.9 J	ND									
Methyl Methacrylate	NR	NR	NR	ND	ND	ND	1 J	4 J	ND	NR						
Methyl-tert-Butyl-Ether	NR	NR	NR	ND	ND	3	4 J	4 J	ND	ND						

**Table 5**  
**Soil Vapor Extraction Containment System**  
**Site 1, Former Drum Marshalling Yard**  
**Naval Weapons Industrial Reserve Plant - Bethpage, NY**  
**Quarterly Vapor Monitoring Results of SVE Wells**  
**Through Third Quarter 2013**

Sample ID	SVE 105I															
	12/21/09	03/31/10	06/09/10	09/16/10	12/08/10	03/30/11	06/28/11	09/06/11	10/14/11	02/10/12	05/11/12	09/11/12	12/05/12	01/15/13	05/16/13	08/27/13
<b>Analysis by TO-15 (<math>\mu\text{g}/\text{m}^3</math>)</b>																
1,1,1-Trichloroethane	9.9	11	29	ND	24	1	1J	21	31	11	13	26	22	22	11	24
1,1,2,2-Tetrachloroethane	NR	NR	NR	ND	ND	ND	0.8J	1J	0.9J	ND						
1,1,2-Trichloroethane	NR	NR	NR	ND	ND	ND	0.7J	0.8J	0.9J	ND						
1,1-Dichloroethene	ND	5.7	13	ND	6	ND	0.6J	5	7	4.2	5.6	5.6	10	12	8.8	8.0
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	0.6J	0.6J	0.5J	ND						
1,2,2,3-Trichloropropane	NR	NR	NR	ND	ND	ND	0.7J	0.8J	0.9J	NR						
1,2,2,3-Trimethylbenzene	NR	NR	NR	14	ND	1	0.7J	1	2	NR						
1,2,4-Trichlorobenzene	NR	NR	NR	ND	ND	ND	ND	ND	1J	ND						
1,2,4-Trimethylbenzene	NR	NR	NR	44	3	4	1	3	7	1.4J	1.7J	2.8J	1.9J	ND	1.2J	1.1J
1,2-Dibromoethane	NR	NR	NR	ND	ND	ND	0.9J	ND	0.8J	ND						
1,2-Dichlorobenzene	NR	NR	NR	ND	ND	ND	0.9J	ND	0.8J	ND						
1,2-Dichloroethane	NR	ND	ND	ND	ND	ND	0.7J	0.6J	0.5J	ND						
1,2-Dichloropropane	NR	NR	NR	ND	ND	ND	0.7J	0.5J	0.6J	ND						
1,3,5-Trimethylbenzene	NR	NR	NR	10	ND	1	2	0.9J	1	0.48J	ND	0.92J	ND	ND	ND	ND
1,3-Butadiene	NR	NR	NR	ND												
1,3-Dichlorobenzene	NR	NR	NR	ND	ND	ND	ND	ND	0.7J	ND						
1,4-Dichlorobenzene	NR	NR	NR	ND	ND	ND	ND	ND	0.7J	ND						
1,4-Dioxane	NR	NR	NR	ND	ND	ND	0.7J	0.7J	0.6J	ND						
2,2,4-Trimethylpentane	NR	ND	ND	0.97J	ND	ND	ND	ND								
2-Butanone	NR	NR	NR	4	1	6	6	2	1	3.6J	ND	ND	3.3J	ND	2.4J	ND
2-Hexanone	NR	NR	NR	ND	ND	ND	0.7J	0.6J	0.4J	ND						
2-Propanol	NR	ND														
3-Chloro-1-propene	NR	NR	NR	ND	ND	ND	0.4J	ND								
4-Ethyltoluene	NR	NR	NR	7	ND	ND	3	0.8J	1	0.94J	0.53J	1.3J	1.6J	ND	0.40J	0.73J
4-Methyl-2-pentanone	NR	ND														
Acetone	NR	NR	NR	11	3	15	27	9	4	25	4.7J	7.8J	17J	6.2J	30	10J
alpha-Chlorotoluene	NR	NR	NR	ND	ND	ND	0.5J	ND	0.7J	ND						
Acrylonitrile	NR	NR	NR	ND	ND	ND	0.3J	0.4J	ND	NR						
Benzene	NR	NR	NR	ND	ND	4	1	0.6J	0.6J	ND	ND	0.63J	1.0J	ND	ND	ND
Benzyl Chloride	NR	NR	NR	ND	ND	ND	ND	ND	ND	NR						
Bromodichloromethane	NR	NR	NR	ND	ND	ND	1J	1J	0.9J	ND						
Bromoform	NR	NR	NR	ND	ND	ND	1J	1J	1J	ND						
Bromomethane	NR	NR	NR	ND	ND	ND	0.8	0.6J	0.5J	ND						
Carbon Disulfide	NR	NR	NR	ND	ND	ND	0.9	0.6J	0.6J	ND	ND	1.8J	6.9J	ND	3.7J	ND
Carbon Tetrachloride	NR	NR	NR	ND	ND	ND	1	1J	1	ND						
Chlorobenzene	NR	NR	NR	ND	ND	ND	0.6J	0.5J	0.6J	ND	ND	2.9J, B	ND	ND	ND	ND
Chlorodibromomethane	NR	NR	NR	ND	ND	ND	1J	0.9J	1J	NR						
Chloroethane	NR	NR	NR	ND	ND	ND	0.7	0.4J	0.4J	ND						
Chloroform	NR	NR	NR	ND	2	ND	0.9J	4	3	0.78J	1.0J	3.2J	ND	ND	1.9J	3.1J
Chloromethane	NR	NR	NR	0.9	ND	ND	3	0.5	0.4	ND						
cis-1,2-Dichloroethene	ND	6.6	20	ND	ND	ND	1	10	16	8.1	9.7	13	16	13	14	14
cis-1,3-Dichloropropene	NR	NR	NR	ND	13	ND	0.5J	ND	0.5J	ND						
Cumene	NR	ND														
Cyclohexane	NR	NR	NR	ND	3	ND	0.7J	0.6J	0.5J	ND	ND	ND	0.91J	ND	ND	ND
Dichlorodifluoromethane	NR	NR	NR	2	2	2	3	2	3	ND						
Diisopropyl ether	NR	NR	NR	ND	ND	ND	0.6J	ND	NR							
Ethanol	NR	NR	NR	5	1	37	19	3	2	15	1.1J	2.8J	15	ND	ND	ND
Ethyl Acetate	NR	NR	NR	ND	2	ND	ND	ND	ND	NR						
Ethyl tert-butyl ether	NR	NR	NR	ND	ND	0.5J	0.5J	0.4J	NR							
Ethylbenzene	NR	NR	NR	4	ND	3	3	0.9	1	ND						
Freon 11	NR	1.1J	0.87J	1.5J	1.6J	1.2J	1.3J									
Freon 113	NR	NR	NR	ND	2	ND	2	3	3	1.8J	5.5J	3.2J	11	8.1	3.7J	4.2J
Freon 114	NR	NR	NR	ND	ND	1J	1J	1J	1J	ND						
Freon 12	NR	2.3J	1.8J	2.0J	2.7J	3.1J	2.4J	2.4J								
Heptane	NR	NR	NR	ND	3	3	0.5J	0.5J	0.5J	ND	ND	ND	1.2J	ND	ND	ND

**Table 5**  
**Soil Vapor Extraction Containment System**  
**Site 1, Former Drum Marshalling Yard**  
**Naval Weapons Industrial Reserve Plant - Bethpage, NY**  
**Quarterly Vapor Monitoring Results of SVE Wells**  
**Through Third Quarter 2013**

Sample ID	SVE 105D															
	12/21/09	03/31/10	06/09/10	09/16/10	12/08/10	03/30/11	06/28/11	09/06/11	12/02/11	02/10/12	05/11/12	09/11/12	12/05/12	01/15/13	05/16/13	08/27/13
<b>Analysis by TO-15 (<math>\mu\text{g}/\text{m}^3</math>)</b>																
1,1,1-Trichloroethane	550	47	320	1000	590	ND	1J	490	930	350	320	270	380	430	160	110
1,1,2,2-Tetrachloroethane	NR	NR	NR	ND	ND	0.9 J	8 J	ND								
1,1,2-Trichloroethane	NR	NR	NR	ND	ND	0.8 J	6 J	ND								
1,1-Dichloroethene	300	28	270	250	ND	ND	0.6 J	74	150	69	78	72	110	110	46	45
1,1-Dichloroethene	3.9	ND	ND	2	4	4	0.6 J	6 J	ND							
1,2,2,3-Trichloropropane	NR	NR	NR	ND	ND	0.9 J	7 J	ND	NR							
1,2,2,3-Trimethylbenzene	NR	NR	NR	8	ND	ND	3	ND	ND	NR						
1,2,4-Trichlorobenzene	NR	NR	NR	ND												
1,2,4-Trimethylbenzene	NR	NR	NR	30	4	2	8	ND	ND	ND	3.4 J	2.8 J	ND	ND	ND	1.0 J
1,2-Dibromoethane	NR	NR	NR	ND	ND	1 J	ND									
1,2-Dichlorobenzene	NR	NR	NR	ND	ND	4	ND									
1,2-Dichloroethane	NR	ND	ND	ND	ND	4	5 J	ND								
1,2-Dichloropropane	NR	NR	NR	ND	ND	0.7 J	5 J	ND								
1,3,5-Trimethylbenzene	NR	NR	NR	6	ND	2	ND									
1,3-Butadiene	NR	NR	NR	ND	ND	0.4	3 J	ND								
1,3-Dichlorobenzene	NR	NR	NR	ND	ND	0.6 J	ND									
1,4-Dichlorobenzene	NR	NR	NR	ND	ND	0.7 J	ND									
1,4-Dioxane	NR	NR	NR	ND	ND	0.8	ND									
2,2,4-Trimethylpentane	NR	ND														
2-Butanone	NR	NR	NR	7	2	2	4	6 J	ND							
2-Hexanone	NR	NR	NR	ND	ND	0.7 J	7 J	ND								
2-Propanol	NR	ND	ND	ND	ND	7.9	ND	ND								
3-Chloro-1-propene	NR	NR	NR	ND	ND	0.5 J	3 J	ND								
4-Ethyltoluene	NR	NR	NR	5	ND	2	ND	0.33 J	0.64 J	ND						
4-Methyl-2-pentanone	NR	ND														
Acetone	NR	NR	NR	35	5	11	22	10	5	ND	15 J	10 J	5.3 J	ND	10 J	11 J
alpha-Chlorotoluene	NR	NR	NR	ND	ND	0.7 J	ND									
Acrylonitrile	NR	NR	NR	ND	ND	0.4 J	4 J	ND	NR							
Benzene	NR	NR	NR	ND	1	3	1	4 J	ND							
Benzyl Chloride	NR	NR	NR	ND	ND	ND	ND	ND	NR							
Bromodichloromethane	NR	NR	NR	6	ND	ND	1 J	8 J	ND							
Bromoform	NR	NR	NR	ND	ND	1 J	ND									
Bromomethane	NR	NR	NR	ND	ND	0.6 J	6 J	ND								
Carbon Disulfide	NR	NR	NR	ND	ND	0.8	4 J	ND	ND	ND	3.9 J	ND	ND	1.6 J	ND	ND
Carbon Tetrachloride	NR	NR	NR	3	6	ND	1	10 J	ND	4.0 J	8.1 J	ND	ND	6.3 J	14	7.2
Chlorobenzene	NR	NR	NR	ND	ND	1	ND	ND	ND	ND	5.9 J, B	ND	ND	ND	ND	ND
Chlorodibromomethane	NR	NR	NR	ND	ND	1 J	9 J	ND	NR							
Chloroethane	NR	NR	NR	1	1	ND	0.5 J	4 J	ND							
Chloroform	NR	NR	NR	ND	4	ND	0.8 J	10 J	3 J	ND	2.7 J	3.8 J	ND	1.9 J	3.9	ND
Chloromethane	NR	NR	NR	1	ND	ND	2	3 J	ND							
cis-1,2-Dichloroethene	61	36	85	300	ND	ND	0.7 J	150	380	190	220	150	210	200	73	76
cis-1,3-Dichloropropene	NR	NR	NR	ND	ND	0.6 J	ND									
Cumene	NR	ND														
Cyclohexane	NR	NR	NR	ND	ND	1	0.8	ND	ND	ND	ND	ND	ND	4.6	ND	ND
Dichlorodifluoromethane	NR	NR	NR	2	5	2	3	9 J	3 J	ND						
Diisopropyl ether	NR	NR	NR	2	ND	ND	ND	ND	ND	NR						
Ethanol	NR	NR	NR	8	2	26	12	10	10	5.2 J	ND	ND	ND	5.2 J	9.6	ND
Ethyl Acetate	NR	NR	NR	2	ND	ND	ND	ND	ND	NR						
Ethyl tert-butyl ether	NR	NR	NR	ND	ND	0.6 J	4 J	ND	NR							
Ethylbenzene	NR	NR	NR	4	ND	2	3	ND	ND	ND	ND	ND	ND	0.60 J	ND	ND
Freon 11	NR	ND	ND	ND	ND	1.4 J	1.4 J	ND								
Freon 113	NR	NR	NR	81	89	ND	2	62	40	18 J	43	37	64	58	19	21
Freon 114	NR	NR	NR	ND	ND	ND	1 J	10 J	ND							
Freon 12	NR	ND	2.9 J	ND	4.4 J	3.8	2.5 J	ND								
Heptane	NR	NR	NR	ND	ND	1	0.9	5 J	ND							
Hexachlorobutadiene	NR	NR	NR	ND	ND	2 J	ND									
Hexane	NR	NR	NR	5	2	5	2	4 J								

**Table 5**  
**Soil Vapor Extraction Containment System**  
**Site 1, Former Drum Marshalling Yard**  
**Naval Weapons Industrial Reserve Plant - Bethpage, NY**  
**Quarterly Vapor Monitoring Results of SVE Wells**  
**Through Third Quarter 2013**

Sample ID	SVE 106I															
	12/21/09	03/31/10	06/09/10	09/16/10	12/08/10	03/30/11	06/28/11	09/06/11	10/14/11	02/10/12	05/11/12	09/11/12	12/05/12	01/15/13	05/16/13	08/27/13
<b>Analysis by TO-15 (<math>\mu\text{g}/\text{m}^3</math>)</b>																
1,1,1-Trichloroethane	220	8.6	ND	4	ND	NA	6	3	7	1.0 J	2.2 J	11	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	NR	NR	NR	ND	ND	NA	1 J	0.8 J	1 J	ND						
1,1,2-Trichloroethane	NR	NR	NR	ND	ND	NA	0.7 J	0.6 J	0.8 J	ND						
1,1-Dichloroethane	120	ND	ND	1	ND	NA	1	0.5 J	1	0.62 J	0.70 J	1.6 J	2.5 J	1.9 J	ND	ND
1,1-Dichloroethene	ND	ND	ND	ND	ND	NA	0.6 J	2	0.6 J	ND						
1,2,2,3-Trichloropropane	NR	NR	NR	ND	ND	NA	0.9 J	0.6 J	0.9 J	NR						
1,2,2,3-Trimethylbenzene	NR	NR	NR	9	ND	NA	9	1	2	NR						
1,2,4-Trichlorobenzene	NR	NR	NR	2	ND	NA	2	ND	0.8 J	ND						
1,2,4-Trimethylbenzene	NR	NR	NR	29	ND	NA	29	3	6	1.1 J	2.2 J	3.2 J	1.2 J	ND	ND	0.97 J
1,2-Dibromoethane	NR	NR	NR	ND	ND	NA	1 J	ND	1 J	ND						
1,2-Dichlorobenzene	NR	NR	NR	1	ND	NA	0.7 J	ND	0.9 J	ND						
1,2-Dichloroethane	NR	ND	ND	0.8	ND	NA	0.6 J	0.5 J	0.6 J	ND						
1,2-Dichloropropane	NR	NR	NR	ND	ND	NA	0.7 J	ND	0.7 J	ND						
1,3,5-Trimethylbenzene	NR	NR	NR	6	ND	NA	5	0.9 J	1	ND	ND	0.84 J	ND	ND	ND	ND
1,3-Butadiene	NR	NR	NR	1	ND	NA	ND	2	0.6	ND	0.87 J	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	NR	NR	NR	ND	ND	NA	ND	0.7 J	ND							
1,4-Dichlorobenzene	NR	NR	NR	ND	ND	NA	0.7 J	2	0.7 J	ND	ND	0.74 J	0.36 J	ND	ND	ND
1,4-Dioxane	NR	NR	NR	ND	ND	NA	0.7	0.5 J	0.6 J	ND						
2,2,4-Trimethylpentane	NR	ND	120	ND	620	ND	ND	ND								
2-Butanone	NR	NR	NR	4	ND	NA	7	0.5 J	2	0.70 J	ND	ND	ND	ND	ND	ND
2-Hexanone	NR	NR	NR	ND	ND	NA	1	0.6 J	0.5 J	ND						
2-Propanol	NR	ND	ND	ND	2.1 J	5.5 J	ND	ND								
3-Chloro-1-propene	NR	NR	NR	ND	ND	NA	0.4 J	0.5 J	0.4 J	ND						
4-Ethyltoluene	NR	NR	NR	5	ND	NA	5	1	1	0.37 J	2.0 J	2.5 J	0.93 J	ND	ND	0.82 J
4-Methyl-2-pentanone	NR	ND														
Acetone	NR	NR	NR	5	5	NA	22	11	9	5.6 J	9.5 J	3.7 J	7.5 J	8.6 J	16 J	23
alpha-Chlorotoluene	NR	NR	NR	ND	ND	NA	0.6 J	ND	0.7 J	ND						
Acrylonitrile	NR	NR	NR	0.4	ND	NA	0.4 J	0.4 J	ND	NR						
Benzene	NR	NR	NR	0.8	ND	NA	0.9	0.9	0.6 J	ND	ND	ND	3.7	0.94 J	ND	ND
Benzyl Chloride	NR	NR	NR	1	ND	NA	0.7 J	ND	ND	NR						
Bromodichloromethane	NR	NR	NR	ND	ND	NA	0.8 J	0.5 J	1 J	ND						
Bromoform	NR	NR	NR	ND	ND	NA	1 J	0.3 J	2 J	ND						
Bromomethane	NR	NR	NR	0.9	ND	NA	0.6 J	2	0.6 J	ND						
Carbon Disulfide	NR	NR	NR	0.8	ND	NA	0.8	0.5 J	0.6	ND	ND	2.2 J	ND	ND	6.3 J	ND
Carbon Tetrachloride	NR	NR	NR	2	ND	NA	1	ND	3	0.91 J	0.55 J	ND	2.9 J	2.0 J	ND	ND
Chlorobenzene	NR	NR	NR	ND	ND	NA	0.7 J	0.3 J	0.7 J	ND	ND	2.5 J, B	ND	ND	ND	ND
Chlorodibromomethane	NR	NR	NR	ND	ND	NA	1 J	1	1 J	NR						
Chloroethane	NR	NR	NR	0.6	ND	NA	0.7	0.8	0.5 J	ND						
Chloroform	NR	NR	NR	1	ND	NA	2	0.4 J	2	ND	1.4 J	1.5 J	ND	ND	ND	ND
Chloromethane	NR	NR	NR	0.8	0.8	NA	2	ND	0.4	ND						
cis-1,2-Dichloroethene	46	ND	ND	4	ND	NA	6	0.5 J	4	1.6 J	2.3 J	7.5	5.4	3.7	ND	ND
cis-1,3-Dichloropropene	NR	NR	NR	ND	ND	NA	0.6 J	ND	0.5 J	ND						
Cumene	NR	ND														
Cyclohexane	NR	NR	NR	ND	ND	NA	0.6 J	ND	0.4 J	ND	2.9	ND	ND	1.1 J	ND	ND
Dichlorodifluoromethane	NR	NR	NR	3	2	NA	3	0.8 J	3	ND						
Diisopropyl ether	NR	NR	NR	ND	ND	NA	ND	ND	ND	NR						
Ethanol	NR	NR	NR	3	2	NA	15	9	1	1.6 J	ND	ND	ND	3.4 J	8.8	ND
Ethyl Acetate	NR	NR	NR	ND	ND	NA	ND	ND	ND	NR						
Ethyl tert-butyl ether	NR	NR	NR	ND	ND	NA	0.6 J	0.4 J	0.5 J	NR						
Ethylbenzene	NR	NR	NR	3	ND	NA	4	2	1	ND	3.6	1.4 J	ND	ND	ND	ND
Freon 11	NR	1.2 J	0.96 J	1.5 J	1.3 J	1.4 J	1.6 J	1.0 J								
Freon 113	NR	NR	NR	4	ND	NA	5	4	12	12	6.5	3.0 J	13	22	ND	ND
Freon 114	NR	NR	NR	2	ND	NA	1 J	0.9 J	1 J	ND						
Freon 12	NR	2.1 J	2.2 J	2.9 J	2.7 J	3.0 J	2.4 J	2.1 J								
Heptane	NR	NR	NR	ND	ND	NA	0.8 J	0.7 J	0.5 J	ND	7.6	ND	ND	29	1.0 J	

**Table 5**  
**Soil Vapor Extraction Containment System**  
**Site 1, Former Drum Marshalling Yard**  
**Naval Weapons Industrial Reserve Plant - Bethpage, NY**  
**Quarterly Vapor Monitoring Results of SVE Wells**  
**Through Third Quarter 2013**

Sample ID	SVE 106D															
	12/21/09	03/31/10	06/09/10	09/16/10	12/08/10	03/30/11	06/28/11	09/06/11	10/14/11	02/10/12	05/11/12	09/11/12	12/05/12	01/15/13	05/16/13	08/27/13
<b>Analysis by TO-15 (<math>\mu\text{g}/\text{m}^3</math>)</b>																
1,1,1-Trichloroethane	340	32	30	20	12	9	20	23	29	ND	11	26	18	ND	ND	27
1,1,2,2-Tetrachloroethane	NR	NR	NR	ND	ND	ND	ND	0.9 J	1 J	ND						
1,1,2-Trichloroethane	NR	NR	NR	ND	2	5	4	3	3	ND	3.0	4.3	5.8	ND	ND	4.9
1,1-Dichloroethene	250	6.3	ND	5	ND	ND	ND	0.5 J	0.7 J	0.8	ND	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	NR	NR	NR	ND	ND	ND	ND	0.7 J	1 J	NR						
1,2,3-Trimethylbenzene	NR	NR	NR	8	ND	ND	6	ND	2	NR						
1,2,4-Trichlorobenzene	NR	NR	NR	ND	ND	1 J	ND	0.9 J	ND	1.9 J	ND	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	NR	NR	NR	17	2	23	ND	4	ND	ND	3.6 J	1.3 J	ND	ND	0.77 J	ND
1,2-Dibromoethane	NR	NR	NR	ND	ND	ND	ND	1 J	ND							
1,2-Dichlorobenzene	NR	NR	NR	ND	ND	ND	ND	ND	1 J	ND						
1,2-Dichloroethane	NR	ND	ND	ND	ND	ND	ND	0.6 J	0.7 J	ND						
1,2-Dichloropropane	NR	NR	NR	ND	ND	ND	ND	0.6 J	0.8 J	ND						
1,3,5-Trimethylbenzene	NR	NR	NR	6	ND	ND	4	ND	1	ND	2.3 J	0.97 J	ND	ND	ND	ND
1,3-Butadiene	NR	NR	NR	ND	ND	ND	0.3 J	ND								
1,3-Dichlorobenzene	NR	NR	NR	ND	ND	ND	ND	0.8 J	ND							
1,4-Dichlorobenzene	NR	NR	NR	ND	ND	ND	ND	0.8 J	ND	0.87 J	ND	ND	ND	ND	ND	ND
1,4-Dioxane	NR	NR	NR	ND	ND	0.5 J	0.7 J	0.7 J	ND							
2,2,4-Trimethylpentane	NR	390	1.2 J	ND	0.76 J	ND	ND	ND								
2-Butanone	NR	NR	NR	8	2	0.8	5	1	2	ND	ND	4.0 J	ND	ND	ND	ND
2-Hexanone	NR	NR	NR	ND	ND	ND	0.5 J	0.8 J	ND							
2-Propanol	NR	ND	ND	ND	ND	1.8 J	ND	ND								
3-Chloro-1-propene	NR	NR	NR	ND	ND	ND	0.4 J	0.4 J	ND							
4-Ethyltoluene	NR	NR	NR	6	ND	ND	4	ND	1	ND	2.8 J	2.9 J	ND	0.47 J	ND	ND
4-Methyl-2-pentanone	NR	ND														
Acetone	NR	NR	NR	25	9	5	11	6	6	4.8 J	13 J	11 J	5.8 J	5.4 J	10 J	5.1 J
alpha-Chlorotoluene	NR	NR	NR	ND	ND	ND	ND	0.9 J	ND							
Acrylonitrile	NR	NR	NR	ND	ND	0.4 J	0.4 J	ND	NR							
Benzene	NR	NR	NR	ND	ND	2	0.5 J	0.6 J	0.58 J	1.5 J	1.1 J	ND	0.66 J	1.1 J	ND	ND
Benzyl Chloride	NR	NR	NR	ND	ND	ND	ND	ND	0.6 J	NR						
Bromodichloromethane	NR	NR	NR	ND	ND	ND	ND	0.9 J	1 J	ND						
Bromoform	NR	NR	NR	ND	ND	ND	ND	ND	2 J	ND						
Bromomethane	NR	NR	NR	ND	ND	ND	ND	0.6 J	0.7 J	ND						
Carbon Disulfide	NR	NR	NR	ND	ND	0.6 J	0.6 J	0.6	ND	ND	ND	8.1 J	ND	1.3 J	ND	ND
Carbon Tetrachloride	NR	NR	NR	8	26	17	9	6	18	ND	18	5.6	19	ND	ND	6.1
Chlorobenzene	NR	NR	NR	ND	ND	ND	ND	0.5 J	0.8 J	ND	ND	3.1 J, B	1.0 J	ND	ND	ND
Chlorodibromomethane	NR	NR	NR	ND	ND	ND	ND	1 J	1 J	NR						
Chloroethane	NR	NR	NR	ND	ND	0.4 J	0.4 J	0.4 J	ND							
Chloroform	NR	NR	NR	ND	2	2	5	5	5	ND	6.4	6.9	6.6	ND	ND	4.1
Chloromethane	NR	NR	NR	3	1	0.5	0.7	0.5	0.6	1.2 J	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	79	13	11	13	2	11	11	5	4	ND	4.1	7.1	8.2	ND	ND	10
cis-1,3-Dichloropropene	NR	NR	NR	ND	ND	ND	ND	0.7 J	ND							
Cumene	NR	ND	1.4 J	ND	ND	ND	ND	ND								
Cyclohexane	NR	NR	NR	ND	ND	1	0.4 J	0.4 J	0.4 J	ND	7.0	ND	0.83 J	ND	ND	ND
Dichlorodifluoromethane	NR	NR	NR	6	3	4	2	3	ND							
Diisopropyl ether	NR	NR	NR	ND	ND	ND	ND	1 J	NR							
Ethanol	NR	NR	NR	8	3	2	17	4	ND	2.3 J	ND	8.8	2.3 J	3.7 J	7.7	ND
Ethyl Acetate	NR	NR	NR	ND	ND	ND	ND	ND	ND	NR						
Ethyl tert-butyl ether	NR	NR	NR	ND	ND	ND	0.6 J	0.6 J	NR							
Ethylbenzene	NR	NR	NR	5	ND	5	ND	1	ND	6.3	1.2 J	ND	ND	ND	ND	ND
Freon 11	NR	1.2 J	1.3 J	2.7 J	2.0 J	1.4 J	1.3 J	1.8 J								
Freon 113	NR	NR	NR	ND	18	30	16	25	25	ND	15	13	24	ND	ND	13
Freon 114	NR	NR	NR	ND	ND	ND	ND	1 J	1 J	ND						
Freon 12	NR	1.1 J	2.3 J	3.3 J	2.6 J	2.8 J	2.5 J	3.9 J								
Heptane	NR	NR	NR	ND	ND	ND	1	0.4 J	0.6 J	0.82 J	18	1.0 J	ND	ND	ND	ND
Hexachlorobutadiene	NR	NR	NR	ND	ND	ND	1 J	2 J	ND							
Hexane	NR	NR	NR	3	ND	ND	3	2								

**Table 6**  
**Soil Vapor Extraction Containment System**  
**Site 1, Former Drum Marshalling Yard**  
**Naval Weapons Industrial Reserve Plant - Bethpage, NY**  
**Third Quarter 2013 Off-site Soil Vapor Monitoring of SVPMS**

SVPM/ SVEW Location	Vacuum Reading (i.w.)
<b>Monitoring Date:</b>	<b>8/27/13</b>
BPS1-SVPM2001S	0.08
BPS1-SVPM2001I	0.12
BPS1-SVPM2001D	0.00
BPS1-SVPM2002S	0.12
BPS1-SVPM2002I	0.18
BPS1-SVPM2002D	0.18
BPS1-SVPM2003S	*0.02
BPS1-SVPM2003I	0.04
BPS1-SVPM2003D	0.04
BPS1-SVPM2004S	0.04
BPS1-SVPM2004I	0.04
BPS1-SVPM2004D	0.04
BPS1-SVPM2006S	0.00
BPS1-SVPM2006I	*0.01
BPS1-SVPM2006D	*0.01
BPS1-SVPM2007S	0.00
BPS1-SVPM2007I	*0.01
BPS1-SVPM2007D	*0.01
SV-101I	5.1
SV-101D	23.5
SV-102I	6.9
SV-102D	26.6
SV-103I	3.5
SV-103D	27.7
SV-104I	3.5
SV-104D	9.0
SV-105I	4.3
SV-105D	5.0
SV-106I	4.0
SV-106D	7.0

**Notes:**

i.w. = inches of water column

SVEW = soil vapor extraction well

SVPM = soil vapor pressure monitor

\* Indicates a positive pressure reading was measured as opposed to a negative vacuum reading.

Vacuum readings for the SVPMs were measured using a portable Magnehelic® Differential Pressure Gauge 2000-0, with a range of 0-0.50 i.w. Vacuum readings for SVEWs were recorded from dedicated in-line pressure gauges.

**Table 7**  
**Soil Vapor Extraction Containment System**  
**Site 1, Former Drum Marshalling Yard**  
**Naval Weapons Industrial Reserve Plant - Bethpage, NY**  
**Historical Quarterly Off-site Soil Vapor Monitoring of SVPMS**  
**Through Third Quarter 2013**

SVPMS / SVEW Location	Third Quarter 2012	Fourth Quarter 2012	First Quarter 2013		Second Quarter 2013	Third Quarter 2013
	Vacuum Reading (i.w.)	Vacuum Reading (i.w.)	Vacuum Reading (i.w.) Pre- Vapor Sample Collection	Vacuum Reading (i.w.) Post- Vapor Sample Collection	Vacuum Reading (i.w.)	Vacuum Reading (i.w.)
<b>Monitoring Date:</b>	<b>10/10/2012</b>	<b>12/6/2012</b>	<b>1/15/13</b>	<b>1/16/13</b>	<b>5/29/13</b>	<b>8/27/13</b>
BPS1-SVPM2001S	0.01	0.02	0.01	0.01	0.02	0.08
BPS1-SVPM2001I	0.01	0.02	0.02	0.01	0.10	0.12
BPS1-SVPM2001D	0.01	0.01	0.01	0.01	0.01	0.00
BPS1-SVPM2002S	0.02	0.01	0.02	0.02	0.06	0.12
BPS1-SVPM2002I	0.11	0.10	0.01	0.02	0.10	0.18
BPS1-SVPM2002D	0.12	0.10	0.01	0.01	0.10	0.18
BPS1-SVPM2003S	0.01	0.01	0.03	0.02	0.04	*0.02
BPS1-SVPM2003I	0.04	0.02	0.03	0.04	0.10	0.04
BPS1-SVPM2003D	0.04	0.02	0.01	0.04	0.05	0.04
BPS1-SVPM2004S	0.04	0.04	0.03	0.02	0.03	0.04
BPS1-SVPM2004I	0.04	0.04	0.02	0.01	0.04	0.04
BPS1-SVPM2004D	0.06	0.04	0.03	0.01	0.04	0.04
BPS1-SVPM2006S	0.01	0.01	0.01	0.01	0.02	0.00
BPS1-SVPM2006I	0.01	0.01	0.01	0.01	0.01	*0.01
BPS1-SVPM2006D	0.02	0.02	0.01	0.01	0.02	*0.01
BPS1-SVPM2007S	0.01	0.01	0.01	0.01	0.04	0.00
BPS1-SVPM2007D	0.01	0.01	0.01	0.01	0.04	*0.01
BPS1-SVPM2007I	0.01	0.01	0.01	0.01	0.02	0.02
SV-101I	5	7	10	--	6.0	5.1
SV-101D	10	16	16	--	16.0	23.5
SV-102I	5	3	16	--	3.0	6.9
SV-102D	10	18	10	--	22.0	26.6
SV-103I	5	2	20	--	4.0	3.5
SV-103D	8	24	10	--	24.2	27.7
SV-104I	8	6	20	--	4.0	3.5
SV-104D	11	10	10	--	10.0	9.0
SV-105I	5	9	16	--	7.5	4.3
SV-105D	8	7	8	--	8.0	5.0
SV-106I	5	8	16	--	8.0	4.0
SV-106D	8	12	10	--	11.0	7.0

**Notes:**

i.w. = inches of water column

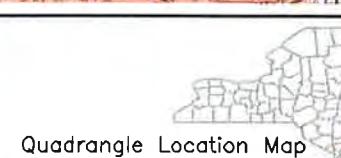
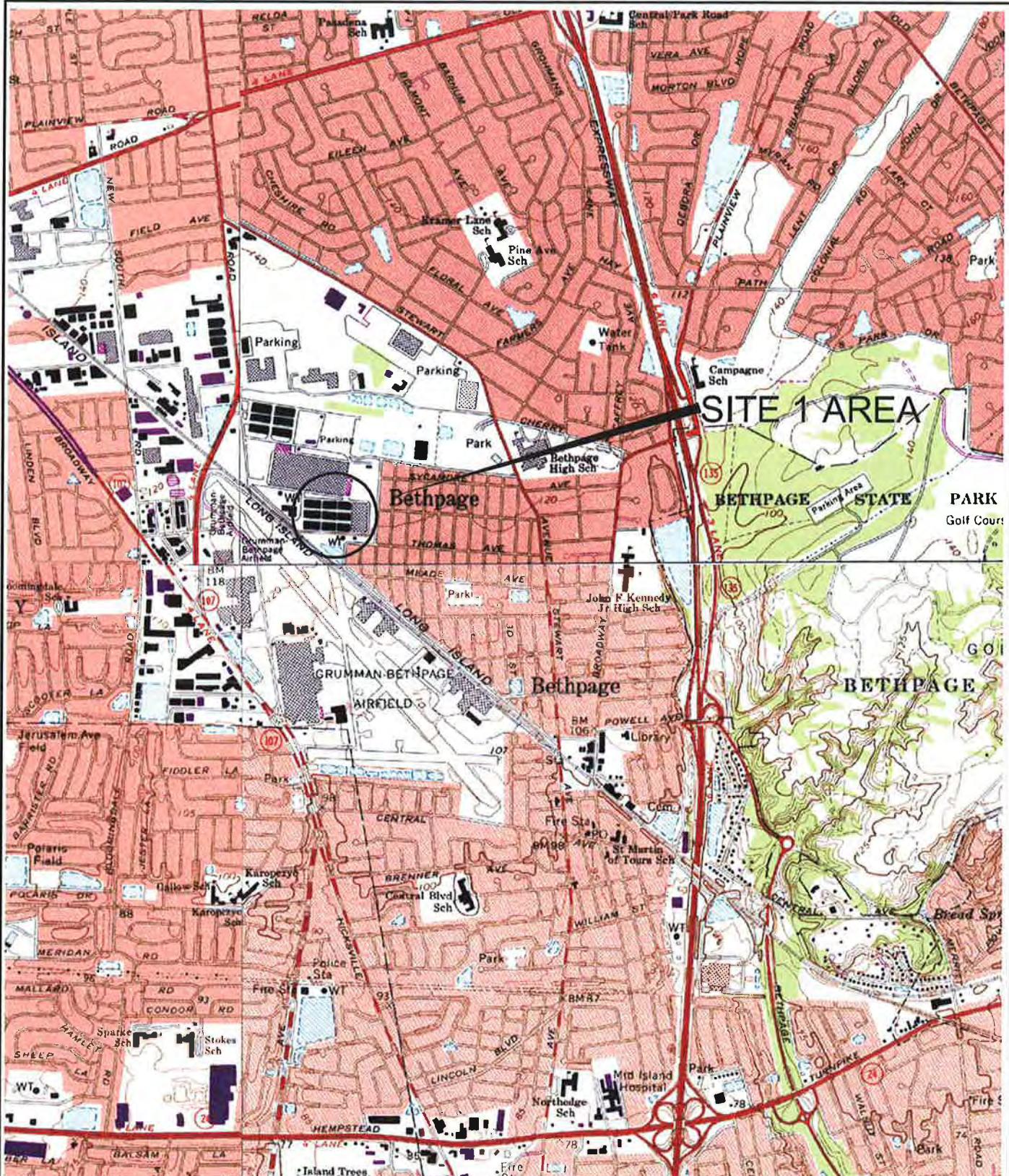
SVEW = soil vapor extraction well

SVPMS = soil vapor pressure monitor

\* Indicates a positive pressure reading was measured as opposed to a negative vacuum reading.

Vacuum readings for the SVPMS were measured using a portable Magnehelic® Differential Pressure Gauge 2000-0, with a range of 0-0.50 i.w. Vacuum readings for SVEWs were recorded from dedicated in-line vacuum gauges.

## **FIGURES**



Quadrangle Location Map

0

2000

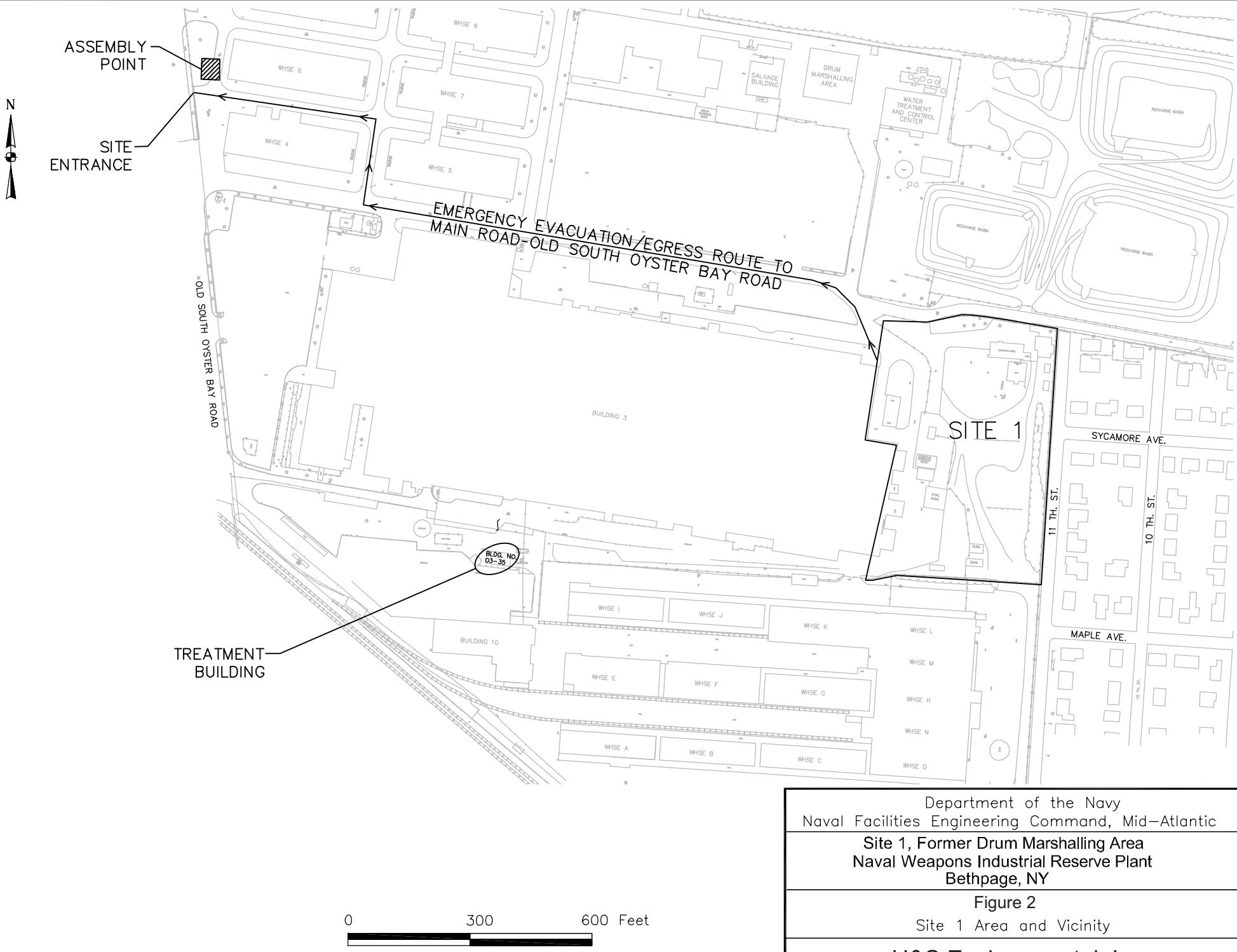
4000 Feet

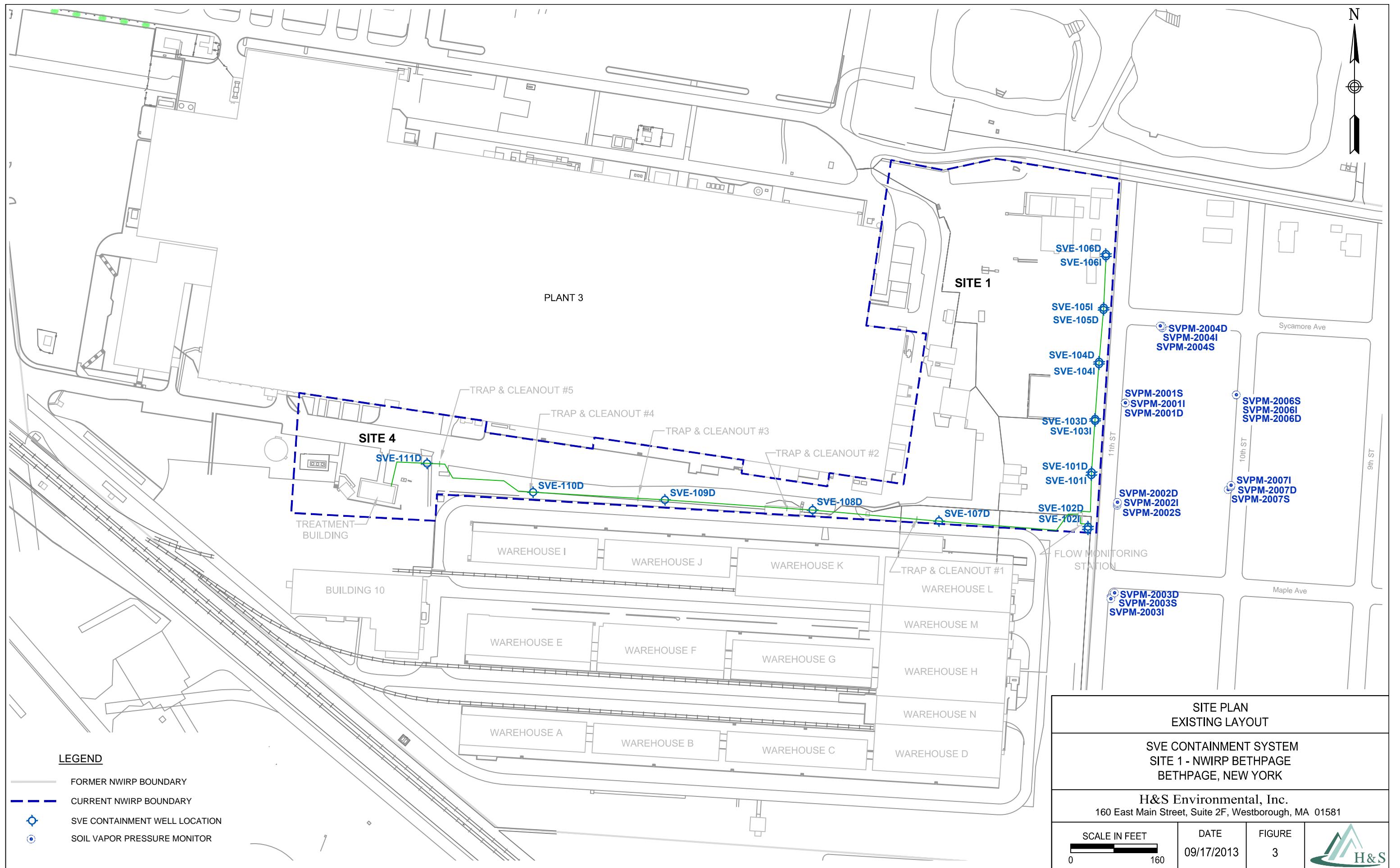


Department of the Navy  
Naval Facilities Engineering Command, Mid-Atlantic  
Site 1, Former Drum Marshalling Area  
Naval Weapons Industrial Reserve Plant  
Bethpage, NY

Figure 1: Site Location Map

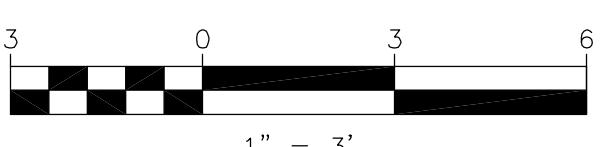
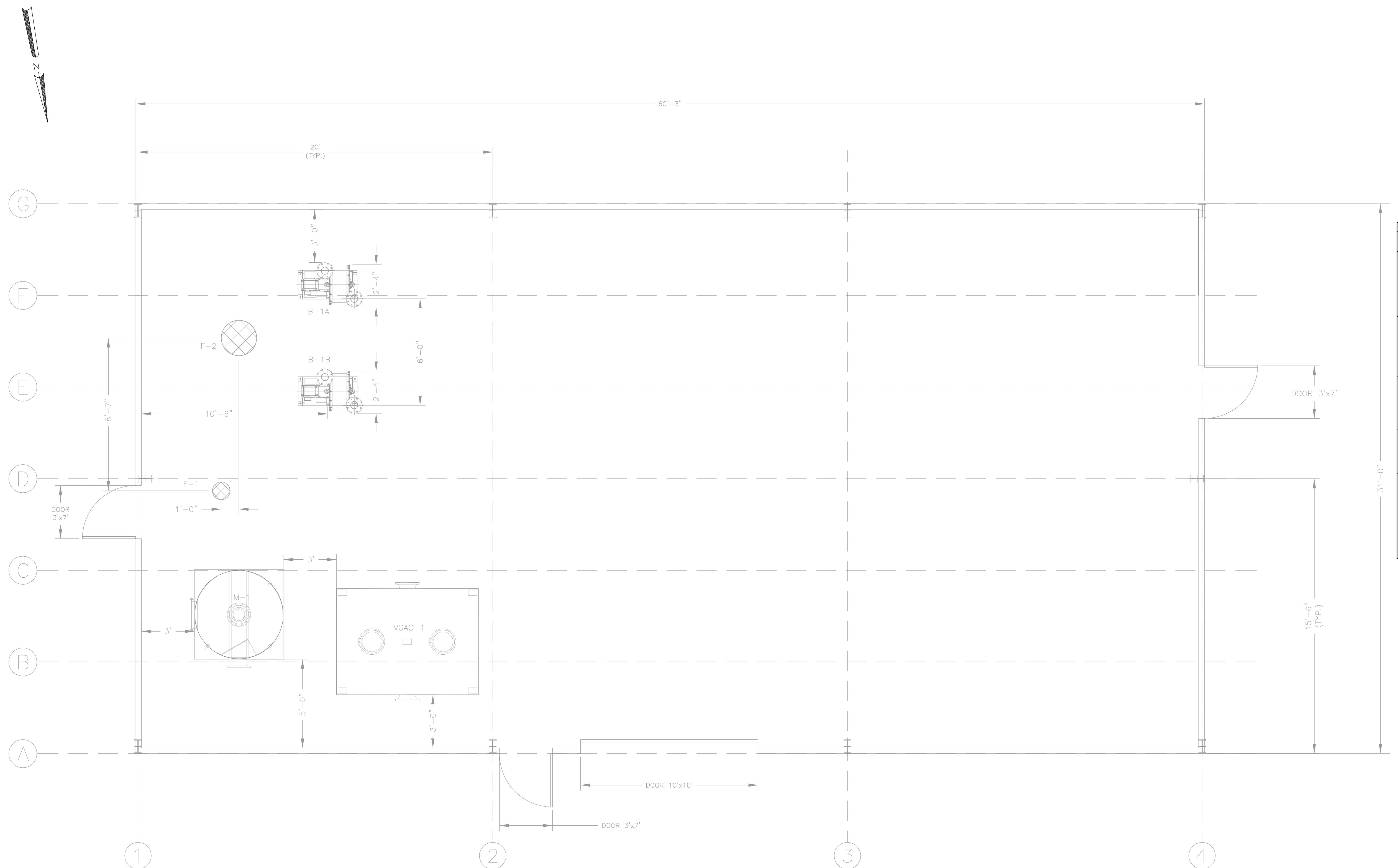
H&S Environmental, Inc.





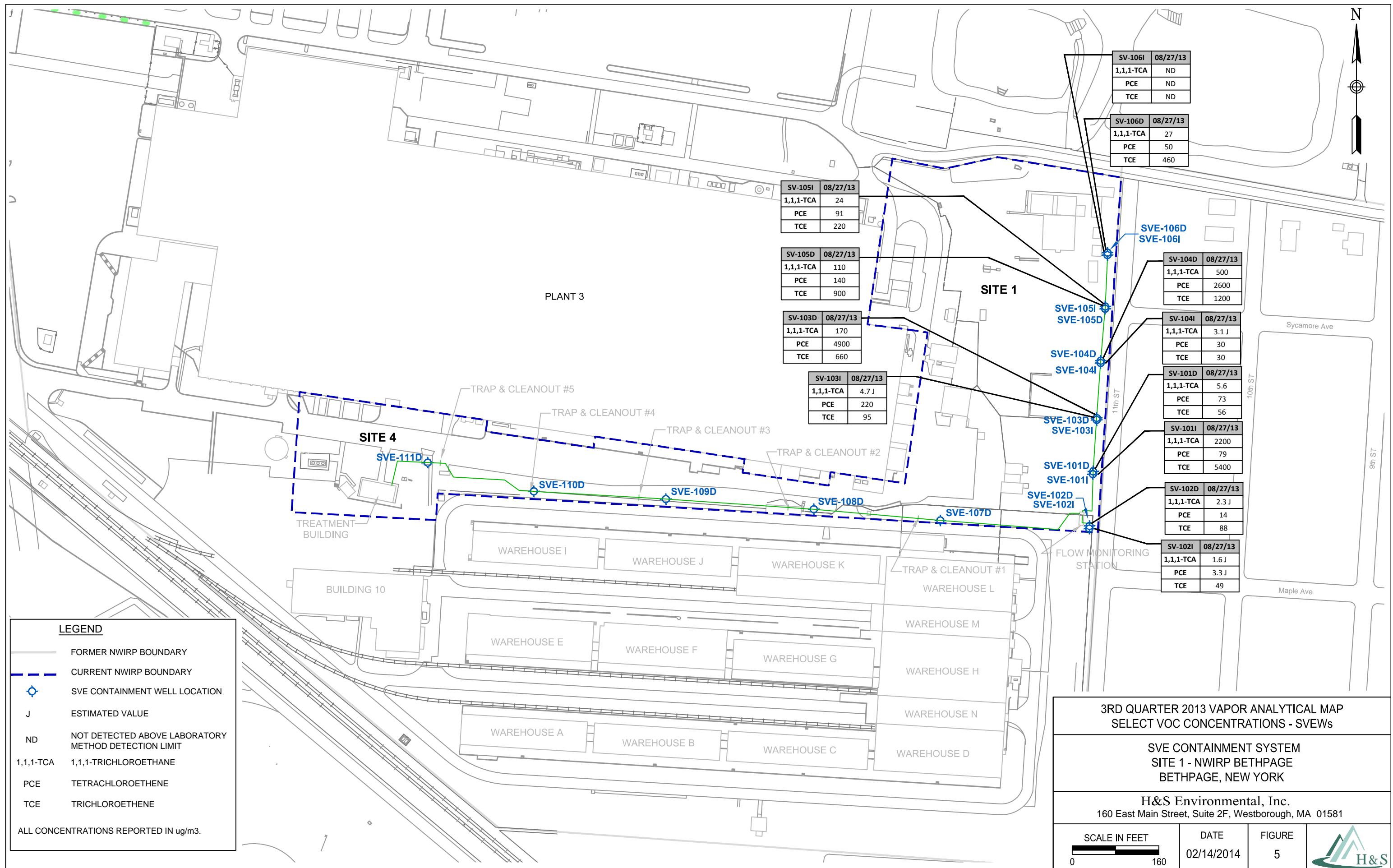
## NOTES:

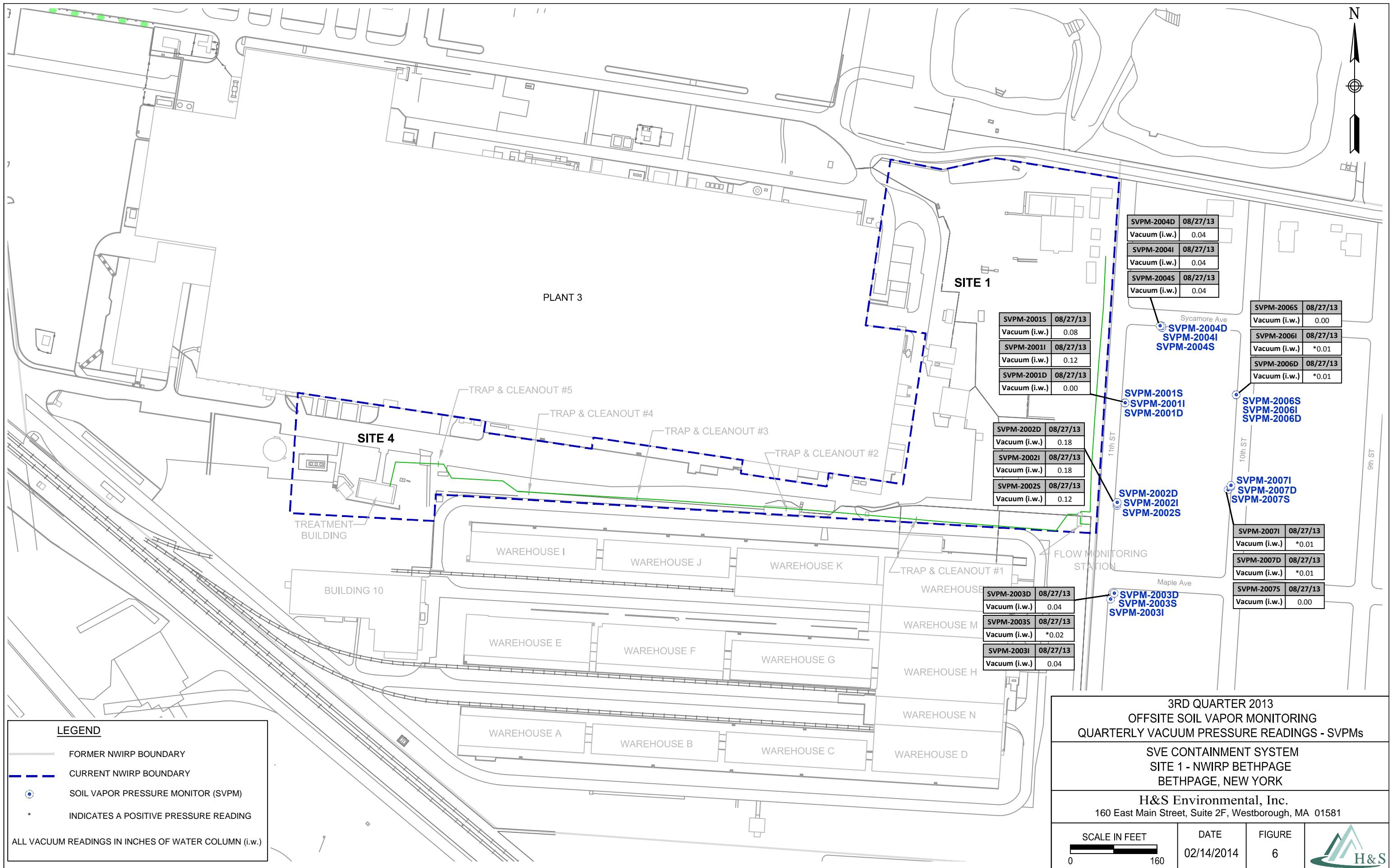
1. ALL MAN DOORS AND OVERHEAD DOORS ARE EXISTING. MAN DOORS ARE APPROXIMATELY 7'x3'. OVERHEAD DOOR IS APPROXIMATELY 10'x10'.



PROCESS EQUIPMENT LIST			
ITEM NUMBER	NUMBER REQUIRED	NAME/DESCRIPTION	APPROVED
M-1	1	MOISTURE SEPARATOR -CONFIGURATION: VERTICAL, CYLINDRICAL -MATERIAL OF CONSTRUCTION: CARBON STEEL, EPOXY INTERIOR COATING, PAINT EXTERIOR COATING -CAPACITY: 400 GALLON CONDENSATE COLLECTION -DIMENSIONS: 5 FT DIA X 6 FEET HT, 718 GALLON	SGP 10-14-09 DLB
F-1	1	MAKE-UP AIR FILTER -CONFIGURATION: INTAKE FILTER/SILENCER COMBINATION HOUSING -MATERIAL OF CONSTRUCTION: CARBON STEEL, CORROSION RESISTANCE COATING -CAPACITY: 500 CFM AT 20 IW, 4 INCH FLANGED CONNECTION	SUBMITTED BY: (FIRM NAME) SOUTHWEST DIV. FPE: _____ OFFICER IN CHARGE: _____ APPROVED
F-2	1	BLOWER AIR FILTER -CONFIGURATION: INLINE VACUUM SERVICE FILTER -MATERIAL OF CONSTRUCTION: CARBON STEEL, CORROSION RESISTANCE COATING -CAPACITY: 1,200 CFM AT 35 IW, 10 INCH FLANGED CONNECTION	
B-1A, B-1B	2	SOIL VAPOR EXTRACTION BLOWER -CONFIGURATION: HORIZONTAL CENTRIFUGAL -RATING: 600 CFM AT 40 IW -MOTOR: 7.5 HP, 460V, 3PH, 60HZ, ODP	
VGAC-1	1	VAPOR-PHASE GRANULAR ACTIVATED CARBON -CONFIGURATION: RECTANGULAR TANK -MATERIAL OF CONSTRUCTION: CARBON STEEL, EPOXY INTERIOR COATING, EPOXY EXTERIOR COATING -RATING: 1,600 CFM AT 3 IW, 2,000 CFM AT 6 IW -CAPACITY: 5,000 LBS CARBON -DIMENSIONS: 6' X 8' FOOTPRINT, 6' 8" HT	

DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND, MID-ATLANTIC NAVAL WEAPONS INDUSTRIAL RESERVE PLANT SITE 1, FORMER DRUM MARSHALLING AREA SOIL VAPOR EXTRACTION SYSTEM LAYOUT PLAN		THIS DRAWING PRODUCED ON AUTOCAD DO NOT REVISE MANUALLY
SEAL AREA	SAT TO	DATE
CODE I.D. NO.	SCALE : AS SHOWN	SPEC. NO.
CONSTR. CONTR. NO. N62473-10-D-3211	SHEET OF	NAVFAc DRAWING NO.
IT IS A VIOLATION OF THE NEW YORK STATE EDUCATION LAW, ARTICLE 145, FOR ANY PERSON UNLESS UNDER THE DIRECTION OF A NEW YORK STATE LICENSED PROFESSIONAL ENGINEER, TO ALTER AN ITEM ON THIS DOCUMENT IN ANY WAY.	SHEET SIZE: D	DIS. SH. NO. 1 - 3





**APPENDIX A**

**NYSDEC AIR PERMIT  
EQUIVALENT APPROVAL**

**New York State Department of Environmental Conservation**

**Division of Environmental Remediation**

Bureau of Remedial Action A

625 Broadway, 11<sup>th</sup> Floor

Albany, New York 12233-7015

Phone: (518) 402-9625 • Fax: (518) 402-9022



**Website:** [www.dec.state.ny.us](http://www.dec.state.ny.us)

February 5, 2010

Lora Fly, Project Manager  
Naval Facilities Engineering Command-Midlant  
9742 Maryland Avenue  
Norfolk, VA 23511-3095

RE: Naval Weapons Industrial Research Plant( NWIRP)  
Site-Bethpage, NYSDEC No. 1-30-003B.

Dear Ms. Fly:

Tetra Tech FW, on behalf of the Department of the Navy (Navy), has submitted the enclosed New York State Department of Environmental Conservation (NYSDEC) Division of Air Resources (DAR) Air Permit Application as a permit equivalent. This DAR Air permit equivalent is for the soil vapor extraction system at Site 1 of Plant 3 of the former Naval Weapons Industrial Reserve Plant (NWIRP) site in Bethpage, NY. The NYSDEC Division of Environmental Remediation (DER) has reviewed the permit equivalent and, by means of this letter approves the Site 1 remedy air discharge for immediate operation.

The NWIRP Site 1 SVE system utilizes the reasonably available control technology (RACT) with activated carbon. The air discharge will be periodically monitored at start up and will be added for routine monitoring in the operation, maintenance and monitoring (OMM) plan, to be submitted shortly for Departmental review.

If you have any questions, please contact me at your earliest convenience at (518)402-9620.

Sincerely,



Steven M. Scharf, P.E.  
Project Engineer  
Division of Environmental Remediation  
Bureau of Remedial Action A

Enclosure

ec/w/enc: J. Swartwout/S. Scharf/File

W. Parish, Region 1 NYSDEC

A. J. Shah, Region 1 NYSDEC

S. Patselos, Tetra Tech FW

J. Cofman, Northrop Grumman

E docs: Region 1, Nassau, Oyster Bay (T): NWIRP Bethpage 130003B-OUI-OMM

New York State Department of Environmental Conservation  
Air Permit Application



DEC ID

APPLICATION ID

OFFICE USE ONLY

### Section I - Certification

#### Title V Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons directly responsible for gathering the information [required pursuant to 6 NYCRR 201-6.3(d)] I believe the information is, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Responsible Official	Title
Signature	Date / /

#### State Facility Certification

I certify that this facility will be operated in conformance with all provisions of existing regulations.

Responsible Official	Title
Signature	Date / /

### Section II - Identification Information

Title V Facility Permit <b>N/A</b>	<input type="checkbox"/> New <input type="checkbox"/> Significant Modification <input type="checkbox"/> Renewal <input type="checkbox"/> Minor Modification	<input type="checkbox"/> Administrative Amendment General Permit Title: _____	<input type="checkbox"/> State Facility Permit <b>N/A</b> <input type="checkbox"/> New <input type="checkbox"/> Modification General Permit Title: _____
<input checked="" type="checkbox"/> Application involves construction of new facility		<input type="checkbox"/> Application involves construction of new emission unit(s)	

#### Owner/Firm

Name <b>US Navy / NAVFAC Midlant</b>	Street Address <b>9742 Maryland Ave, Bldg Z-144</b>	City <b>Norfolk</b>	State <b>VA</b>	Country <b>US</b>	Zip <b>23511 - 3095</b>
Owner Classification <input checked="" type="checkbox"/> Federal <input type="checkbox"/> Corporation/Partnership	<input type="checkbox"/> State <input type="checkbox"/> Individual	<input type="checkbox"/> Municipal	Taxpayer ID  <input type="checkbox"/>		

#### Facility

Name <b>Naval Weapons Industrial Reserve Plant (NWIRP) Site 1</b>	<input type="checkbox"/> Confidential
Location Address <b>Bethpage</b>	
<input type="checkbox"/> City / <input checked="" type="checkbox"/> Town / <input type="checkbox"/> Village <b>Oyster Bay, New York</b>	Zip <b>11714</b>
Project Description  <b>Vapor phase granular activated carbon to remove VOCs from soil/gas</b>	
<input type="checkbox"/> Continuation Sheet(s)	

#### Owner/Firm Contact Mailing Address

Name (Last, First, Middle Initial) <b>Fly, Lora</b>	Phone No. <b>(757) 444-0781</b>	
Affiliation <b>Department of the Navy</b>	Title <b>Remedial PM</b>	Fax No. ( )

Street Address <b>9742 Maryland Ave, Bldg Z-144</b>	City <b>Norfolk</b>	State <b>VA</b>	Country <b>US</b>	Zip <b>23511 - 3095</b>
---	---------------------	-----------------	-------------------	-------------------------

#### Facility Contact Mailing Address

Name (Last, First, Middle Initial)	Phone No. ( )		
Affiliation	Title	Fax No. ( )	
Street Address	State	Country	Zip
City			

**New York State Department of Environmental Conservation  
Air Permit Application**



DEC ID					
-	-	-	-	-	-

**Section III - Facility Information**

Classification					
<input type="checkbox"/> Hospital	<input type="checkbox"/> Residential	<input type="checkbox"/> Educational/Institutional	<input type="checkbox"/> Commercial	<input checked="" type="checkbox"/> Industrial	<input type="checkbox"/> Utility

Affected States (Title V Only) <i>N/A</i>					
<input type="checkbox"/> Vermont	<input type="checkbox"/> Massachusetts	<input type="checkbox"/> Rhode Island	<input type="checkbox"/> Pennsylvania	Tribal Land:	
<input type="checkbox"/> New Hampshire	<input type="checkbox"/> Connecticut	<input type="checkbox"/> New Jersey	<input type="checkbox"/> Ohio	Tribal Land:	

SIC Codes									
9999									

Facility Description					<input type="checkbox"/> Continuation Sheet(s)		
<i>Soil vapor remediation by SVE followed by vapor phase GAC.</i>							

Compliance Statements (Title V Only) <i>N/A</i>									
<p>I certify that as of the date of this application the facility is in compliance with all applicable requirements: <input type="checkbox"/> YES <input type="checkbox"/> NO</p> <p>If one or more emission units at the facility are not in compliance with all applicable requirements at the time of signing this application (the 'NO' box must be checked), the noncomplying units must be identified in the "Compliance Plan" block on page 8 of this form along with the compliance plan information required. For all emission units at this facility that are operating <u>in compliance</u> with all applicable requirements complete the following:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> This facility will continue to be operated and maintained in such a manner as to assure compliance for the duration of the permit, except those units referenced in the compliance plan portion of Section IV of this application.</li> <li><input type="checkbox"/> For all emission units, subject to any applicable requirements that will become effective during the term of the permit, this facility will meet all such requirements on a timely basis.</li> <li><input type="checkbox"/> Compliance certification reports will be submitted at least once a year. Each report will certify compliance status with respect to each requirement, and the method used to determine the status.</li> </ul>									

Facility Applicable Federal Requirements <i>N/A</i>								<input type="checkbox"/> Continuation Sheet(s)		
Title	Type	Part	Sub Part	Section	Sub Division	Paragraph	Sub Paragraph	Clause	Sub Clause	

Facility State Only Requirements								<input type="checkbox"/> Continuation Sheet(s)		
Title	Type	Part	Sub Part	Section	Sub Division	Paragraph	Sub Paragraph	Clause	Sub Clause	

New York State Department of Environmental Conservation  
Air Permit Application



DEC ID									
-	-	-	-	-	-	-	-	-	-

Section III - Facility Information (continued)

Facility Compliance Certification <input type="checkbox"/> N/A								<input type="checkbox"/> Continuation Sheet(s)	
Rule Citation									
Title	Type	Part	Sub Part	Section	Sub Division	Paragraph	Sub Paragraph	Clause	Sub Clause
<input type="checkbox"/> Applicable Federal Requirement	<input type="checkbox"/> Capping			CAS No.	Contaminant Name				
<input type="checkbox"/> State Only Requirement				-	-	-	-	-	-
Monitoring Information									
<input type="checkbox"/> Ambient Air Monitoring		<input type="checkbox"/> Work Practice Involving Specific Operations			<input type="checkbox"/> Record Keeping/Maintenance Procedures				
Description									
<hr/> <hr/> <hr/> <hr/> <hr/>									
Work Practice	Process Material					Reference Test Method			
Type	Code	Description							
Parameter						Manufacturer Name/Model No.			
Code	Description								
Limit			Limit Units						
Upper	Lower	Code	Description						
Averaging Method			Monitoring Frequency			Reporting Requirements			
Code	Description	Code	Description		Code	Description			
<hr/>									

Facility Emissions Summary			<input type="checkbox"/> Continuation Sheet(s)		
CAS No.	Contaminant Name		PTE (lbs/yr)	Range Code	Actual (lbs/yr)
NY075 - 00 - 5	PM-10				
NY075 - 00 - 0	PARTICULATES				
7446 - 09 - 5	SULFUR DIOXIDE				
NY210 - 00 - 0	OXIDES OF NITROGEN				
630 - 08 - 0	CARBON MONOXIDE				
7439 - 92 - 1	LEAD				
NY998 - 00 - 0	VOC		1,222		
NY100 - 00 - 0	HAP		1,813		
00071 - 55 - 6	1,1,1-Trichloroethane (Methyl Chloroform)		591		
00127 - 18 - 4	Tetrachloroethylene		8		
00079 - 01 - 6	Trichloroethylene		1,181		
00075 - 34 - 3	1,1-Dichloroethane		11		
00075 - 35 - 4	1,1-Dichloroethylene (Vinylidene Chloride)		16		

# New York State Department of Environmental Conservation Air Permit Application



---

DEC ID

### **Section III - Facility Information**

New York State Department of Environmental Conservation  
Air Permit Application



DEC ID	-	-	-	-
--------	---	---	---	---

**Section IV - Emission Unit Information**

Emission Unit Description		<input type="checkbox"/> Continuation Sheet(s)
EMISSION UNIT	1-00 EU1 Effluent from first soil vapor extraction blower (BL-1)	
Vapor Phase Granular Activated Carbon Unit. The emission point is stack OCST-2		

Building		<input type="checkbox"/> Continuation Sheet(s)		
Building	Building Name	Length (ft)	Width (ft)	Orientation
03-35	Treatment Building	60	40	0

Emission Point					<input type="checkbox"/> Continuation Sheet(s)		
EMISSION PT.	OCST-2	Height (ft)	Height Above Structure (ft)	Inside Diameter (in)	Exit Temp. (°F)	Cross Section	
						Length (in)	Width (in)
	36	6	8	70			
Exit Velocity (FPS)	Exit Flow (ACFM)	NYTM (E) (KM)	NYTM (N) (KM)	Building	Distance to Property Line (ft)	Date of Removal	
	1,000			03-35	100 <sup>t</sup>		
EMISSION PT.	OCST-2						
Ground Elev. (ft)	Height (ft)	Height Above Structure (ft)	Inside Diameter (in)	Exit Temp. (°F)	Cross Section		
					Length (in)	Width (in)	
Exit Velocity (FPS)	Exit Flow (ACFM)	NYTM (E) (KM)	NYTM (N) (KM)	Building	Distance to Property Line (ft)	Date of Removal	

Emission Source/Control						<input type="checkbox"/> Continuation Sheet(s)		
Emission Source		Date of Construction	Date of Operation	Date of Removal	Control Type		Manufacturer's Name/Model No.	
ID	Type				Code	Description		
BL1/2	1				048	Granular Act. Carbon	Tetrasolv Filtration	
Design Capacity	Design Capacity Units				Waste Feed		Waste Type	
	Code	Description			Code	Description	Code	Description
Emission Source		Date of Construction	Date of Operation	Date of Removal	Control Type		Manufacturer's Name/Model No.	
ID	Type				Code	Description		
Design Capacity	Design Capacity Units				Waste Feed		Waste Type	
	Code	Description			Code	Description	Code	Description

New York State Department of Environmental Conservation  
Air Permit Application



DEC ID					
-	-	-	-	-	-

Section IV - Emission Unit Information (continued)

Process Information				<input type="checkbox"/> Continuation Sheet(s)	
EMISSION UNIT	1 - 00 EU1			PROCESS	SVE
Description					
<p>The Soil Vapor Extraction System will consist of 12 SVE wells (6 intermediate and 6 deep), a moisture separator, and 2 soil vapor extraction blowers (BL-1 and BL-2) which both vent to a vapor phase granular activated carbon unit for treatment prior to discharge from stack #007A. The VGAC unit will be a 5,000 pound unit, filled with Tetrasolv Virgin Carbon. The VGAC unit has been designed to operate nominally at 600 cfm, with a maximum of 1,000 cfm.</p>					
Source Classification Code (SCC)		Total Thruput		Thruput Quantity Units	
		Quantity/Hr	Quantity/Yr	Code	Description
<input type="checkbox"/> Confidential <input checked="" type="checkbox"/> Operating at Maximum Capacity <input type="checkbox"/> Activity with Insignificant Emissions		Operating Schedule		Building	Floor/Location
		Hrs/Day	Days/Yr		
		24	365	03-35	Main
Emission Source/Control Identifier(s)					
BL-1	BL-2				
EMISSION UNIT	-			PROCESS	
Description					
Source Classification Code (SCC)		Total Thruput		Thruput Quantity Units	
		Quantity/Hr	Quantity/Yr	Code	Description
<input type="checkbox"/> Confidential <input type="checkbox"/> Operating at Maximum Capacity <input type="checkbox"/> Activity with Insignificant Emissions		Operating Schedule		Building	Floor/Location
		Hrs/Day	Days/Yr		
Emission Source/Control Identifier(s)					

New York State Department of Environmental Conservation  
Air Permit Application



DEC ID									
-	-	-	-	-	-	-	-	-	-

Section IV - Emission Unit Information (continued)

Emission Unit	Emission Point	Process	Emission Source	Emission Unit Applicable Federal Requirements								<input type="checkbox"/> Continuation Sheet(s)	
				Title	Type	Part	Sub Part	Section	Sub Division	Parag.	Sub Parag.	Clause	Sub Clause
-	-	-	-										
-	-	-	-										
-	-	-	-										
-	-	-	-										

Emission Unit	Emission Point	Process	Emission Source	Emission Unit State Only Requirements								<input type="checkbox"/> Continuation Sheet(s)	
				Title	Type	Part	Sub Part	Section	Sub Division	Parag.	Sub Parag.	Clause	Sub Clause
-	-	-	-										
-	-	-	-										
-	-	-	-										
-	-	-	-										

Emission Unit Compliance Certification										<input type="checkbox"/> Continuation Sheet(s)		
Rule Citation												
Title	Type	Part	Sub Part	Section	Sub Division	Paragraph	Sub Paragraph	Clause	Sub Clause			
6	NYCRR	212	-									
<input type="checkbox"/> Applicable Federal Requirement				<input type="checkbox"/> State Only Requirement				<input type="checkbox"/> Capping				
Emission Unit	Emission Point	Process	Emission Source	CAS No.				Contaminant Name				
1-00EU1	00STA3	SVE		00079-01-6				Trichloroethylene				
Monitoring Information												
<input type="checkbox"/> Continuous Emission Monitoring <input checked="" type="checkbox"/> Intermittent Emission Testing <input type="checkbox"/> Ambient Air Monitoring				<input type="checkbox"/> Monitoring of Process or Control Device Parameters as Surrogate <input type="checkbox"/> Work Practice Involving Specific Operations <input type="checkbox"/> Record Keeping/Maintenance Procedures								
Description												
Monthly grab samples analyzed for VOCs from the VGAC unit influent and effluent												
Work Practice		Process Material						Reference Test Method				
Type	Code	Description										
Parameter								Manufacturer Name/Model No.				
Code		Description										
23		Concentration										
Limit								Limit Units				
Upper		Lower		Code	Description							
36,000				255	micrograms per cubic meter							
Averaging Method				Monitoring Frequency				Reporting Requirements				
Code	Description			Code	Description			Code	Description			
01	Instantaneous			05	Monthly			10	Upon Request			

New York State Department of Environmental Conservation  
Air Permit Application



DEC ID							
-	-	-	-	-	-	-	-

Section IV - Emission Unit Information (continued)

Determination of Non-Applicability (Title V Only) <input checked="" type="checkbox"/> N/A <input type="checkbox"/> Continuation Sheet(s)									
Rule Citation									
Title	Type	Part	Sub Part	Section	Sub Division	Paragraph	Sub Paragraph	Clause	Sub Clause
Emission Unit	Emission Point	Process	Emission Source			<input type="checkbox"/> Applicable Federal Requirement <input type="checkbox"/> State Only Requirement			
Description									
Rule Citation									
Title	Type	Part	Sub Part	Section	Sub Division	Paragraph	Sub Paragraph	Clause	Sub Clause
Emission Unit	Emission Point	Process	Emission Source			<input type="checkbox"/> Applicable Federal Requirement <input type="checkbox"/> State Only Requirement			
Description									
Process Emissions Summary <input type="checkbox"/> Continuation Sheet(s)									
EMISSION UNIT	PROCESS <input checked="" type="checkbox"/> SVE								
CAS No.	Contaminant Name			% Thruput	% Capture	% Control	ERP (lbs/hr)	ERP How Determined	
00071-55-6	1,1,1-Trichloroethane					80	0.34	02	
PTE				Standard Units	PTE How Determined	Actual			
(lbs/hr)	(lbs/yr)	(standard units)	(lbs/hr)			(lbs/yr)			
0.07	591				02				
EMISSION UNIT	PROCESS <input checked="" type="checkbox"/> SVE								
CAS No.	Contaminant Name			% Thruput	% Capture	% Control	ERP (lbs/hr)	ERP How Determined	
00127-18-4	Tetrachloroethylene					80	0.00	02	
PTE				Standard Units	PTE How Determined	Actual			
(lbs/hr)	(lbs/yr)	(standard units)	(lbs/hr)			(lbs/yr)			
0.00 BRT	8				02				
EMISSION UNIT	PROCESS <input checked="" type="checkbox"/> SVE								
CAS No.	Contaminant Name			% Thruput	% Capture	% Control	ERP (lbs/hr)	ERP How Determined	
00079-01-6	Trichloroethylene					80	0.67	02	
PTE				Standard Units	PTE How Determined	Actual			
(lbs/hr)	(lbs/yr)	(standard units)	(lbs/hr)			(lbs/yr)			
0.13	1,181				02				

**New York State Department of Environmental Conservation  
Air Permit Application**



DEC ID	- - - - -
--------	-----------

**Section IV - Emission Unit Information (continued)**

EMISSION UNIT		Emission Unit Emissions Summary				<input checked="" type="checkbox"/> Continuation Sheet(s)	
i-000EU1							
CAS No.		Contaminant Name					
00075-34-3		1,1-Dichloroethane		PTE Emissions	Actual	(lbs/hr)	(lbs/yr)
ERP (lbs/yr)		(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)		
	BRT		11				
CAS No.		Contaminant Name					
00075-35-4		1,1-Dichloroethylene (Vinylidene Chloride)		PTE Emissions	Actual	(lbs/hr)	(lbs/yr)
ERP (lbs/yr)		(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)		
	BRT		16				
CAS No.		Contaminant Name					
00540-59-0		cis-1,2-Dichloroethene		PTE Emissions	Actual	(lbs/hr)	(lbs/yr)
ERP (lbs/yr)		(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)		
	BRT		5				
CAS No.		Contaminant Name					
00107-06-2		1,2-Dichloroethane		PTE Emissions	Actual	(lbs/hr)	(lbs/yr)
ERP (lbs/yr)		(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)		
	BRT		BRT				

Compliance Plan N/A											<input type="checkbox"/> Continuation Sheet(s)	
For any emission units which are not in compliance at the time of permit application, the applicant shall complete the following												
Consent Order			Certified progress reports are to be submitted every 6 months beginning 1/1									
Emission Unit	Process	Emission Source	Applicable Federal Requirement									
-			Title	Type	Part	Sub Part	Section	Sub Division	Parag.	Sub Parag.	Clause	Sub Clause
Remedial Measure / Intermediate Milestones											R/I	Date Scheduled

New York State Department of Environmental Conservation  
Air Permit Application



DEC ID						
-	-	-	-	-	-	-

Section IV - Emission Unit Information

EMISSION UNIT	Emission Unit Emissions Summary (continuation)			
I-00EU1				
CAS No.	Contaminant Name			
00156-60-5	trans-1,2-Dichloroethene			
ERP (lbs/yr)	PTE Emissions (lbs/hr)	(lbs/yr)	Actual (lbs/hr)	(lbs/yr)
	BRT	BRT		
CAS No.	Contaminant Name			
00015-01-4	Vinyl Chloride			
ERP (lbs/yr)	PTE Emissions (lbs/hr)	(lbs/yr)	Actual (lbs/hr)	(lbs/yr)
	BRT	BRT		
CAS No.	Contaminant Name			
ERP (lbs/yr)	PTE Emissions (lbs/hr)	(lbs/yr)	Actual (lbs/hr)	(lbs/yr)
CAS No.	Contaminant Name			
ERP (lbs/yr)	PTE Emissions (lbs/hr)	(lbs/yr)	Actual (lbs/hr)	(lbs/yr)
CAS No.	Contaminant Name			
ERP (lbs/yr)	PTE Emissions (lbs/hr)	(lbs/yr)	Actual (lbs/hr)	(lbs/yr)
CAS No.	Contaminant Name			
ERP (lbs/yr)	PTE Emissions (lbs/hr)	(lbs/yr)	Actual (lbs/hr)	(lbs/yr)
CAS No.	Contaminant Name			
ERP (lbs/yr)	PTE Emissions (lbs/hr)	(lbs/yr)	Actual (lbs/hr)	(lbs/yr)
CAS No.	Contaminant Name			
ERP (lbs/yr)	PTE Emissions (lbs/hr)	(lbs/yr)	Actual (lbs/hr)	(lbs/yr)

New York State Department of Environmental Conservation  
Air Permit Application



DEC ID
- - - - -

**Section IV - Emission Unit Information (continued)**

Request for Emission Reduction Credits						<input type="checkbox"/> Continuation Sheet(s)	
EMISSION UNIT	-	-	-	-	-		
Emission Reduction Description							
Contaminant Emission Reduction Data							
Baseline Period / / to / /						Reduction	
						Date	Method
						/ /	
CAS No.	Contaminant Name					ERC (lbs/yr)	
						Netting	Offset
- -							
- -							
- -							
Facility to Use Future Reduction							
Name						APPLICATION ID	
						- - - - -	
Location Address							
<input type="checkbox"/> City / <input type="checkbox"/> Town / <input type="checkbox"/> Village						State	Zip

Use of Emission Reduction Credits						<input type="checkbox"/> Continuation Sheet(s)	
EMISSION UNIT	-	-	-	-	-		
Proposed Project Description							
Contaminant Emissions Increase Data							
CAS No.	Contaminant Name					PEP (lbs/yr)	
- -							
Statement of Compliance							
<input type="checkbox"/> All facilities under the ownership of this "ownership/firm" are operating in compliance with all applicable requirements and state regulations including any compliance certification requirements under Section 114(a)(3) of the Clean Air Act Amendments of 1990, or are meeting the schedule of a consent order.							
Source of Emission Reduction Credit - Facility							
Name						PERMIT ID	
						- - - - -	
Location Address							
<input type="checkbox"/> City / <input type="checkbox"/> Town / <input type="checkbox"/> Village						State	Zip
Emission Unit	CAS No.	Contaminant Name				ERC (lbs/yr)	
						Netting	Offset
-	-						
-	-						
-	-						

New York State Department of Environmental Conservation  
Air Permit Application



DEC ID									
-	-	-	-	-	-	-	-	-	-

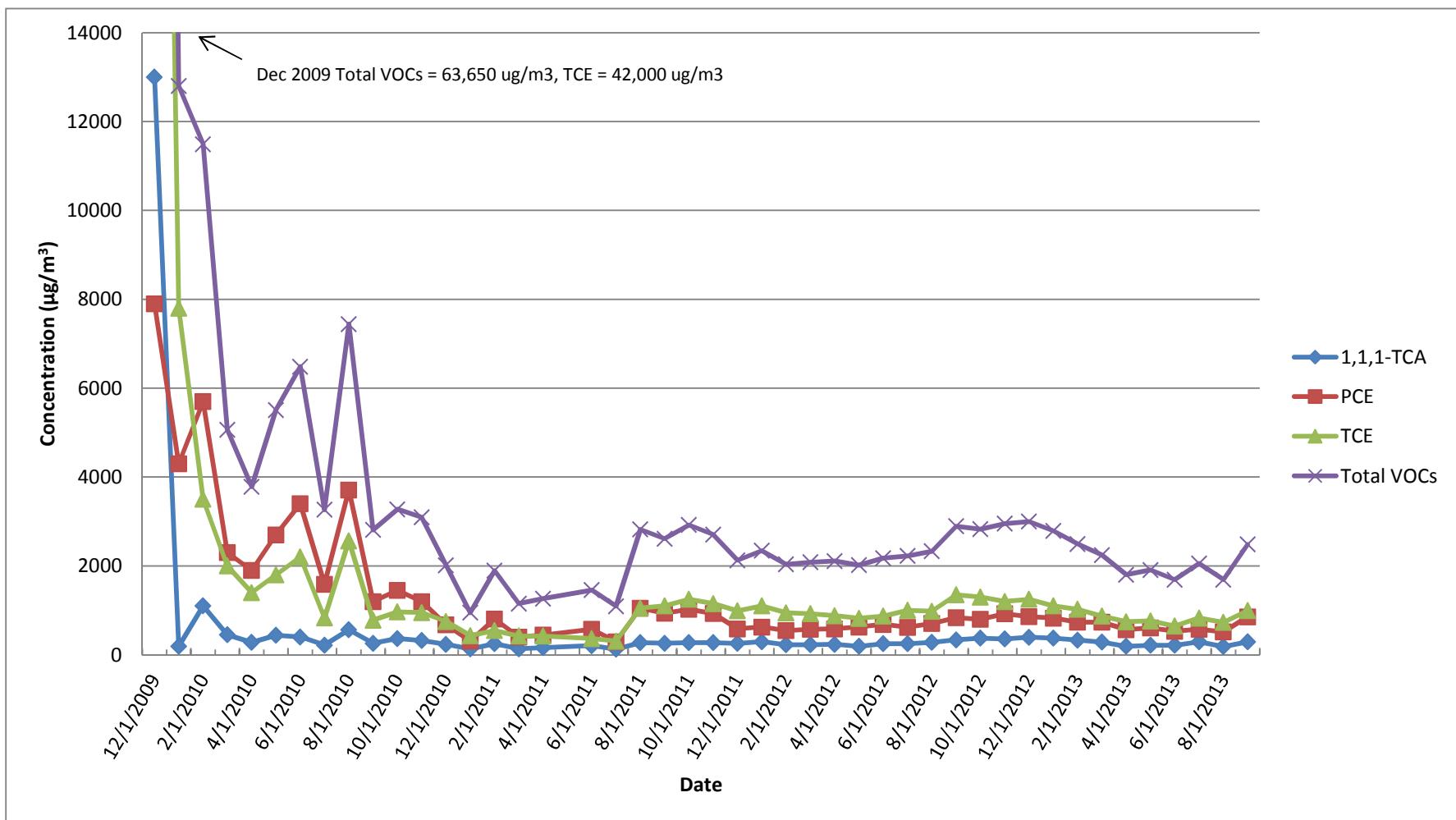
Supporting Documentation

- P.E. Certification (form attached)
- List of Exempt Activities (form attached)
- Plot Plan
- Methods Used to Determine Compliance (form attached)
- Calculations
  - Air Quality Model ( \_\_\_\_ / \_\_\_\_ / \_\_\_\_ )
  - Confidentiality Justification
  - Ambient Air Monitoring Plan ( \_\_\_\_ / \_\_\_\_ / \_\_\_\_ )
  - Stack Test Protocols/Reports ( \_\_\_\_ / \_\_\_\_ / \_\_\_\_ )
  - Continuous Emissions Monitoring Plans/QA/QC ( \_\_\_\_ / \_\_\_\_ / \_\_\_\_ )
  - MACT Demonstration ( \_\_\_\_ / \_\_\_\_ / \_\_\_\_ )
  - Operational Flexibility: Description of Alternative Operating Scenarios and Protocols
  - Title IV: Application/Registration
  - ERC Quantification (form attached)
  - Use of ERC(s) (form attached)
  - Baseline Period Demonstration
  - Analysis of Contemporaneous Emission Increase/Decrease
  - LAER Demonstration ( \_\_\_\_ / \_\_\_\_ / \_\_\_\_ )
  - BACT Demonstration ( \_\_\_\_ / \_\_\_\_ / \_\_\_\_ )
- Other Document(s): \_\_\_\_\_ ( \_\_\_\_ / \_\_\_\_ / \_\_\_\_ )  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

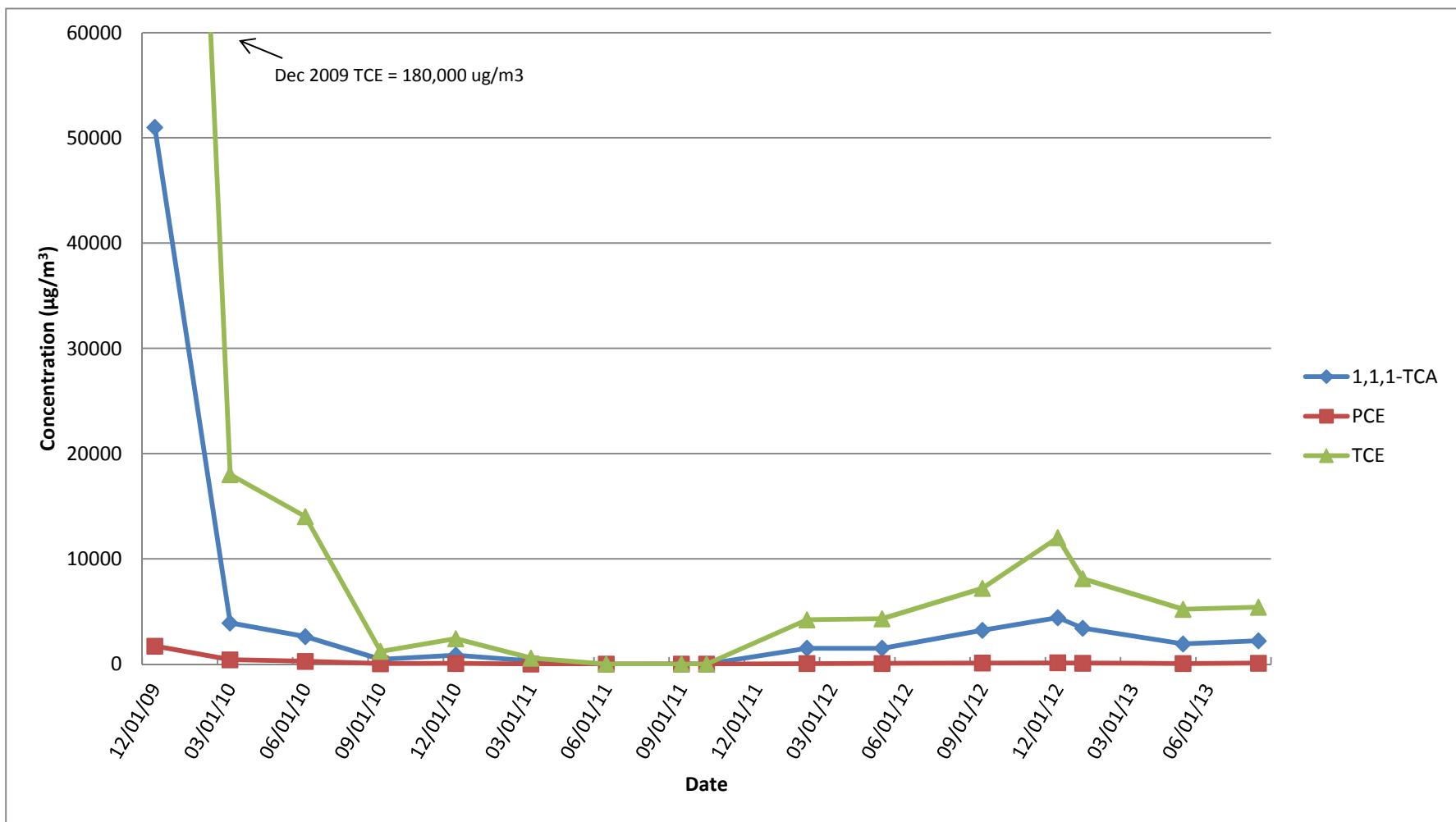
**APPENDIX B**

**VAPOR CONCENTRATION TREND GRAPHS**

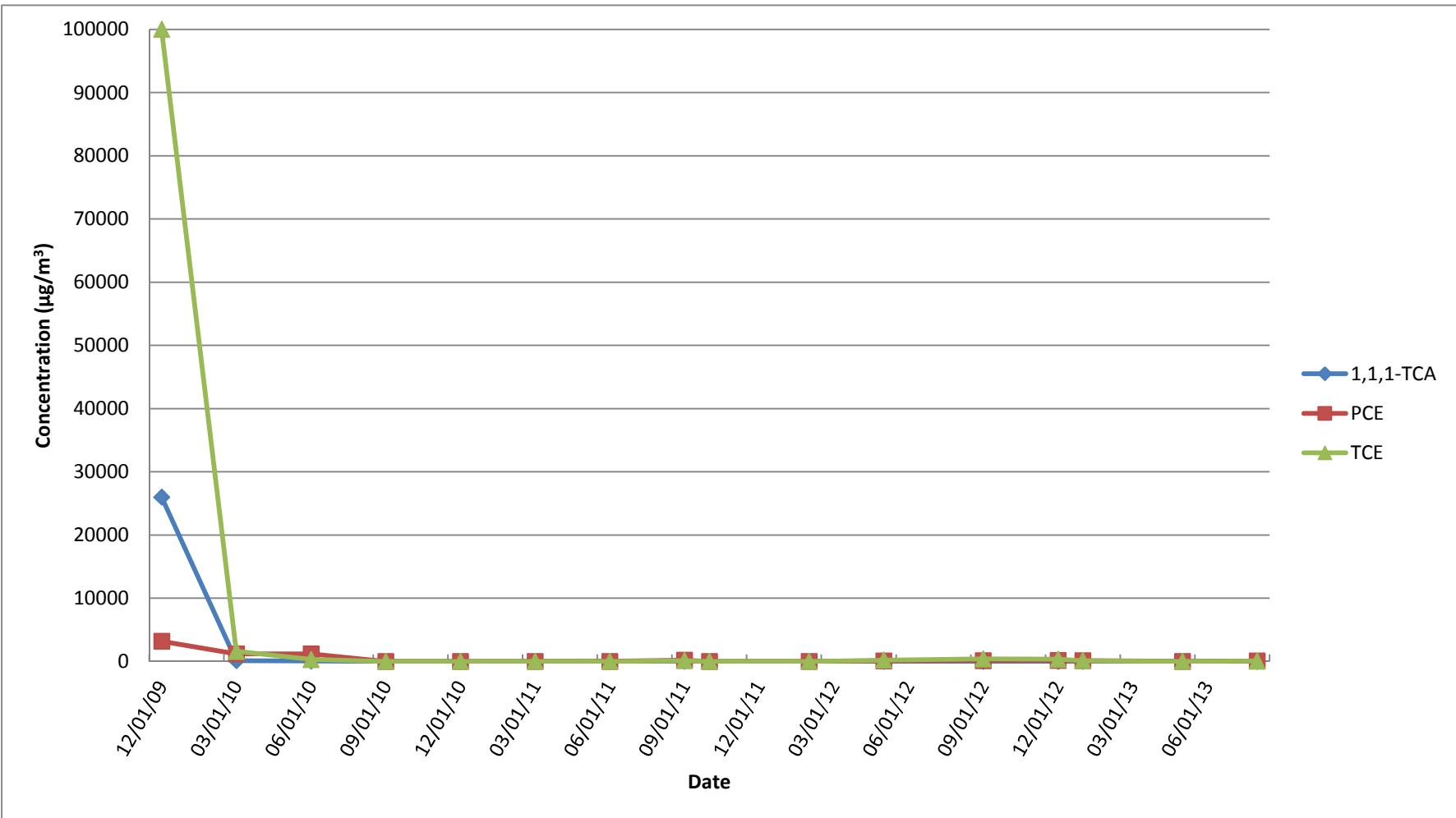
**Soil Vapor Extraction Containment System**  
**Site 1, Former Drum Marshalling Yard**  
**Naval Weapons Industrial Reserve Plant - Bethpage, NY**  
**Vapor Concentration Trends of Select and Total VOCs**  
**COMBINED INFLUENT**



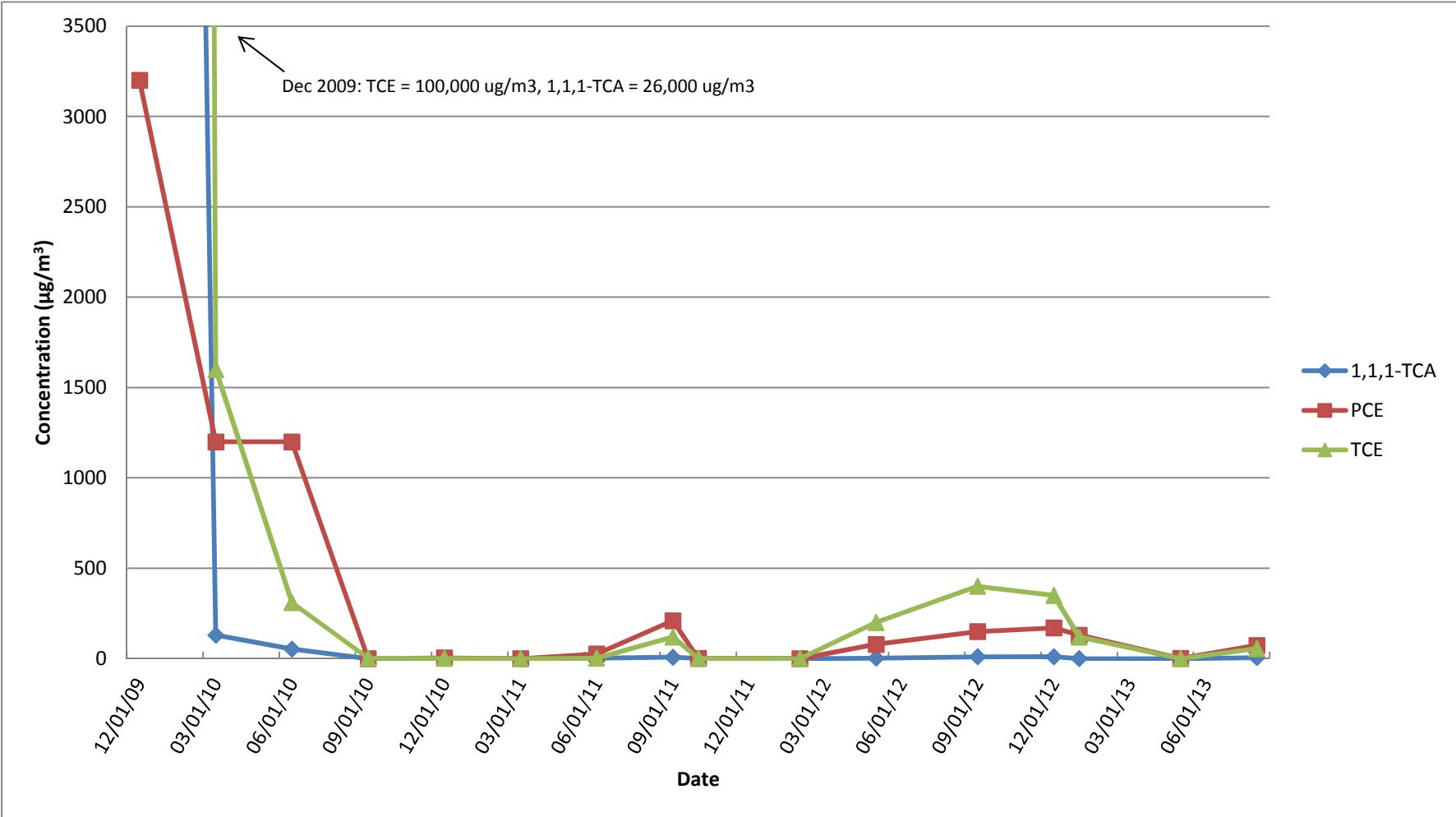
**Soil Vapor Extraction Containment System**  
**Site 1, Former Drum Marshalling Yard**  
**Naval Weapons Industrial Reserve Plant - Bethpage, NY**  
**Groundwater Concentration Trends of Select VOCs**  
**SV-101I**



**Soil Vapor Extraction Containment System  
Site 1, Former Drum Marshalling Yard  
Naval Weapons Industrial Reserve Plant - Bethpage, NY  
Groundwater Concentration Trends of Select VOCs  
SV-101D**

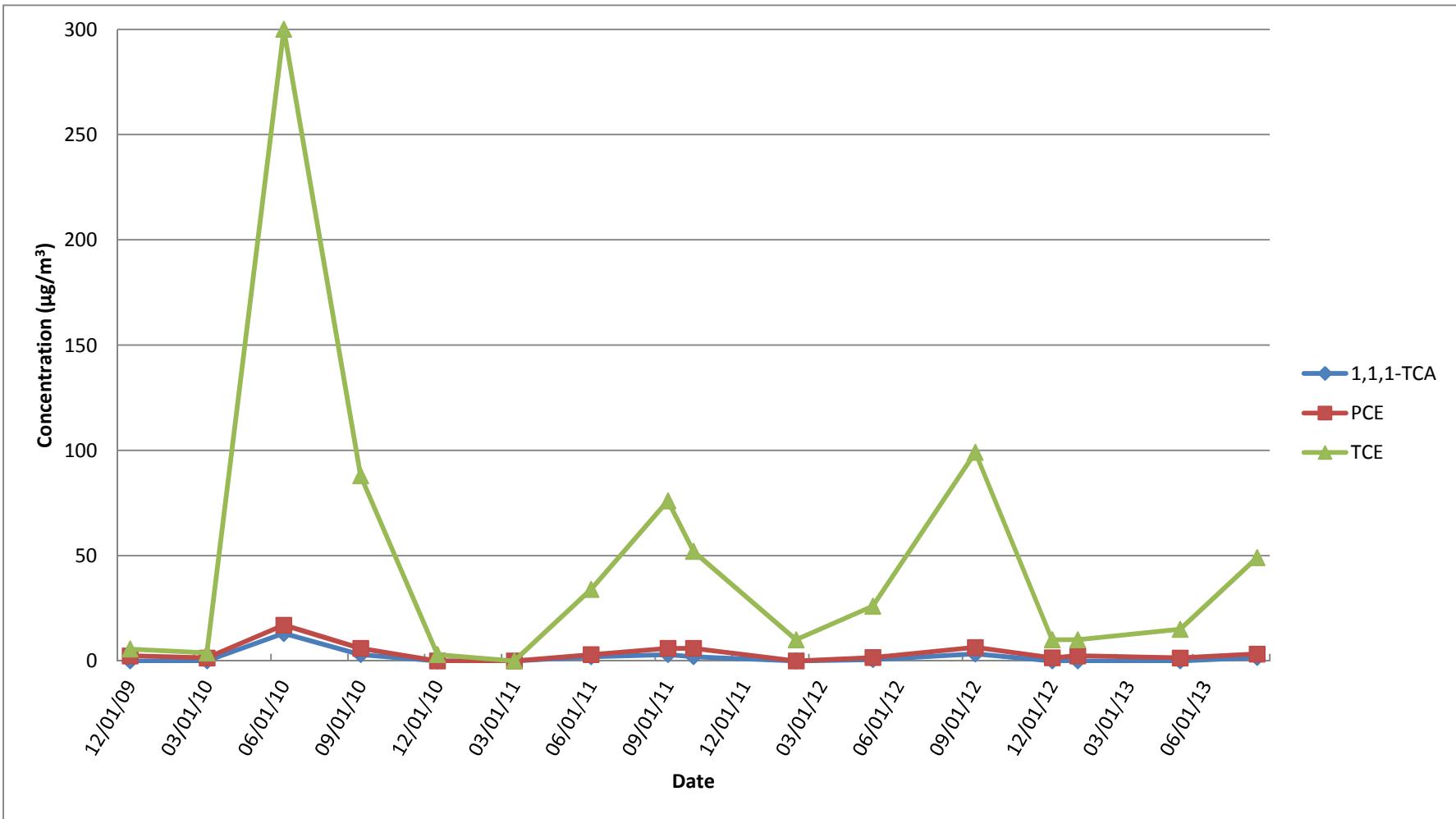


**Soil Vapor Extraction Containment System**  
**Site 1, Former Drum Marshalling Yard**  
**Naval Weapons Industrial Reserve Plant - Bethpage, NY**  
**Groundwater Concentration Trends of Select VOCs**  
**SV-101D (smaller scale)**

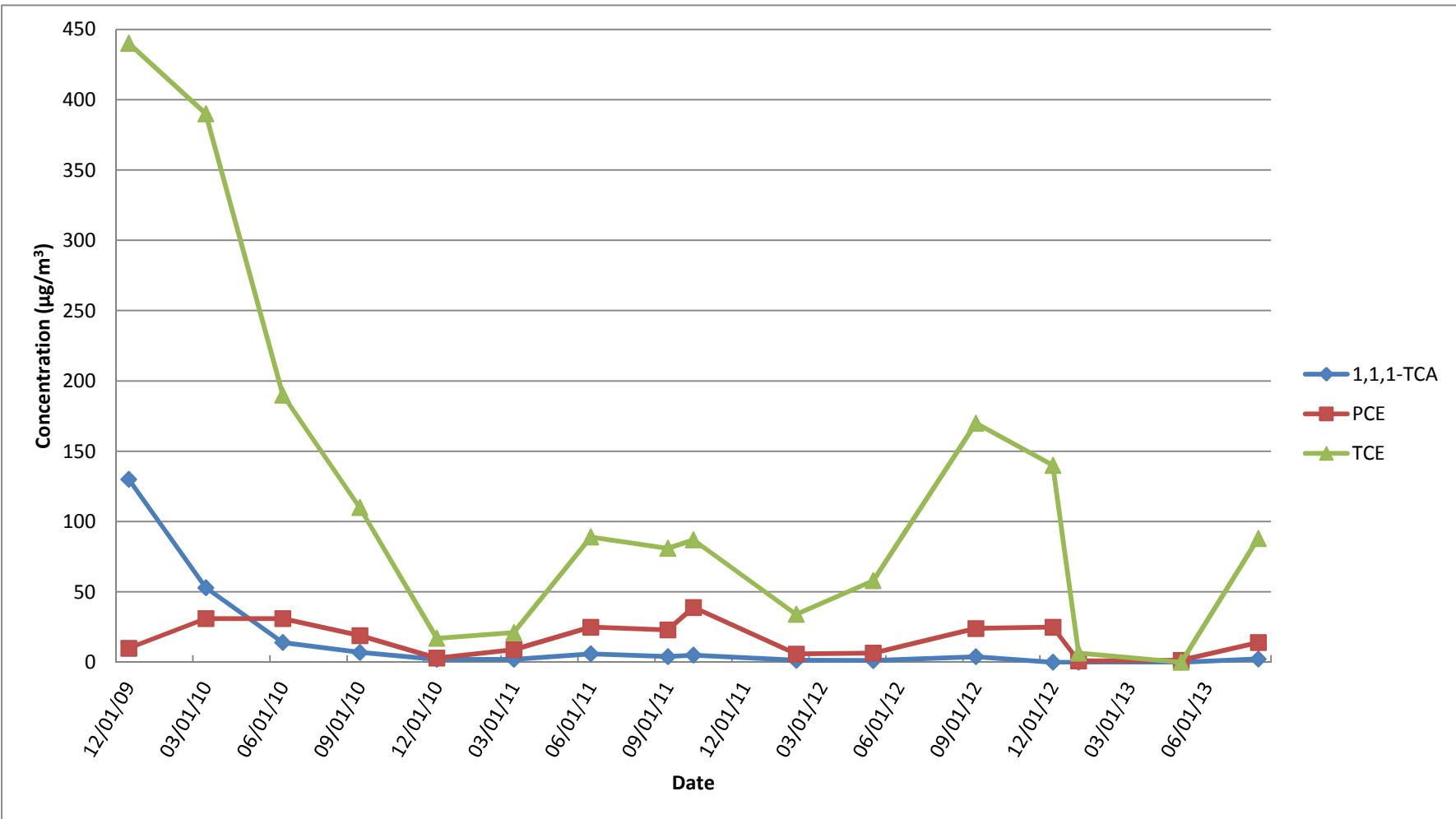


**Soil Vapor Extraction Containment System  
Site 1, Former Drum Marshalling Yard  
Naval Weapons Industrial Reserve Plant - Bethpage, NY  
Groundwater Concentration Trends of Select VOCs**

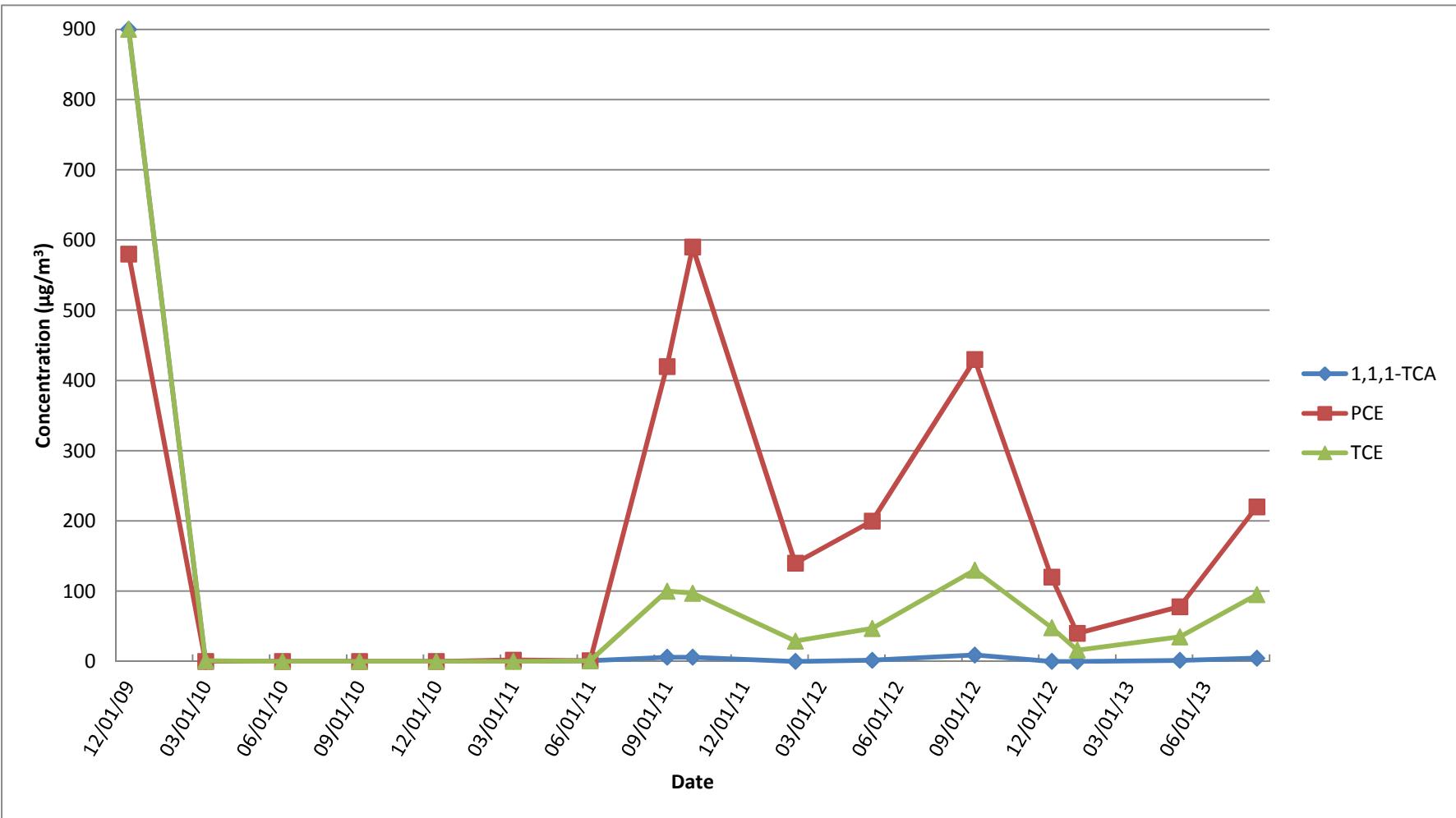
**SV102I**



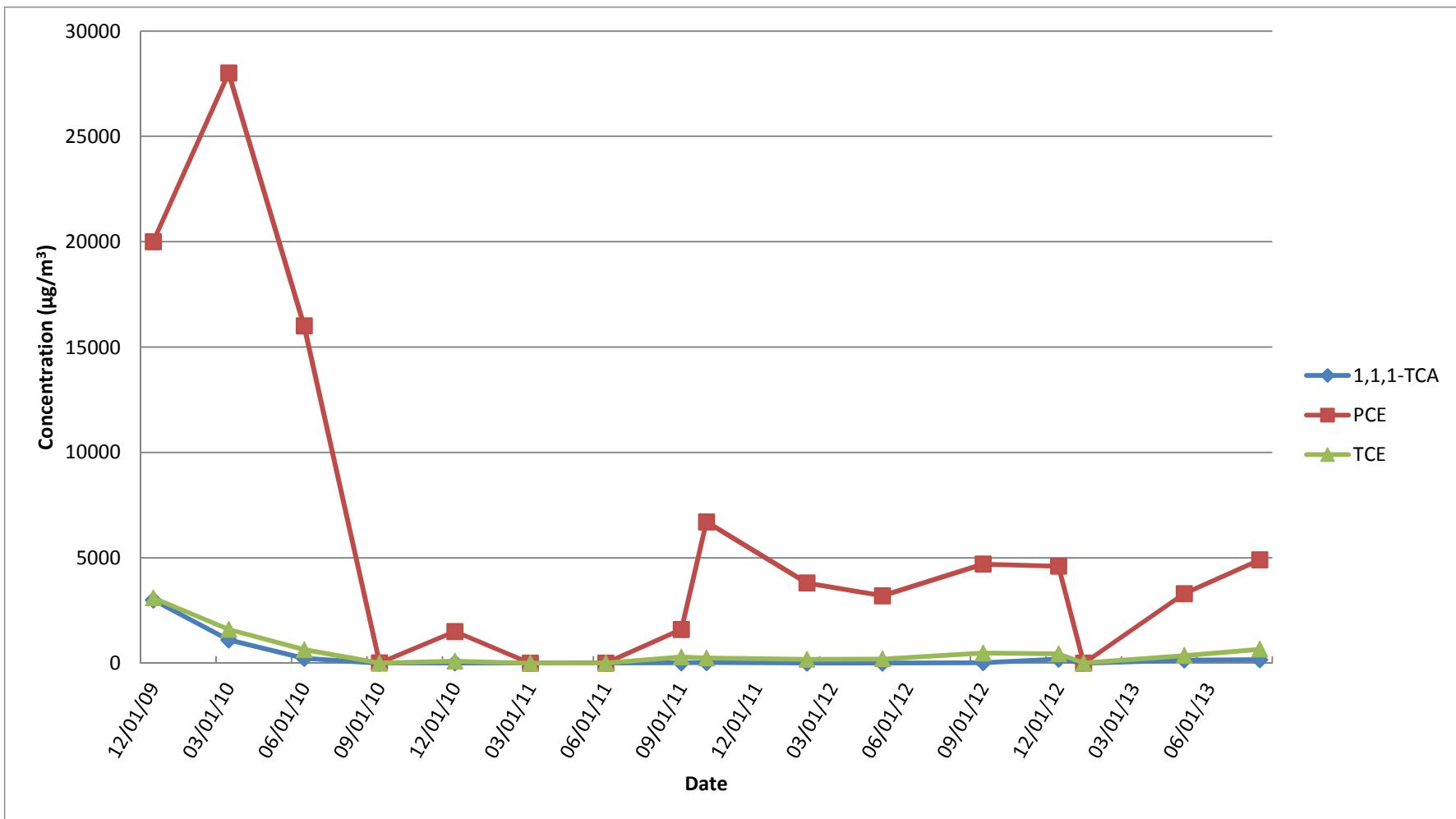
**Soil Vapor Extraction Containment System**  
**Site 1, Former Drum Marshalling Yard**  
**Naval Weapons Industrial Reserve Plant - Bethpage, NY**  
**Groundwater Concentration Trends of Select VOCs**  
**SV-102D**



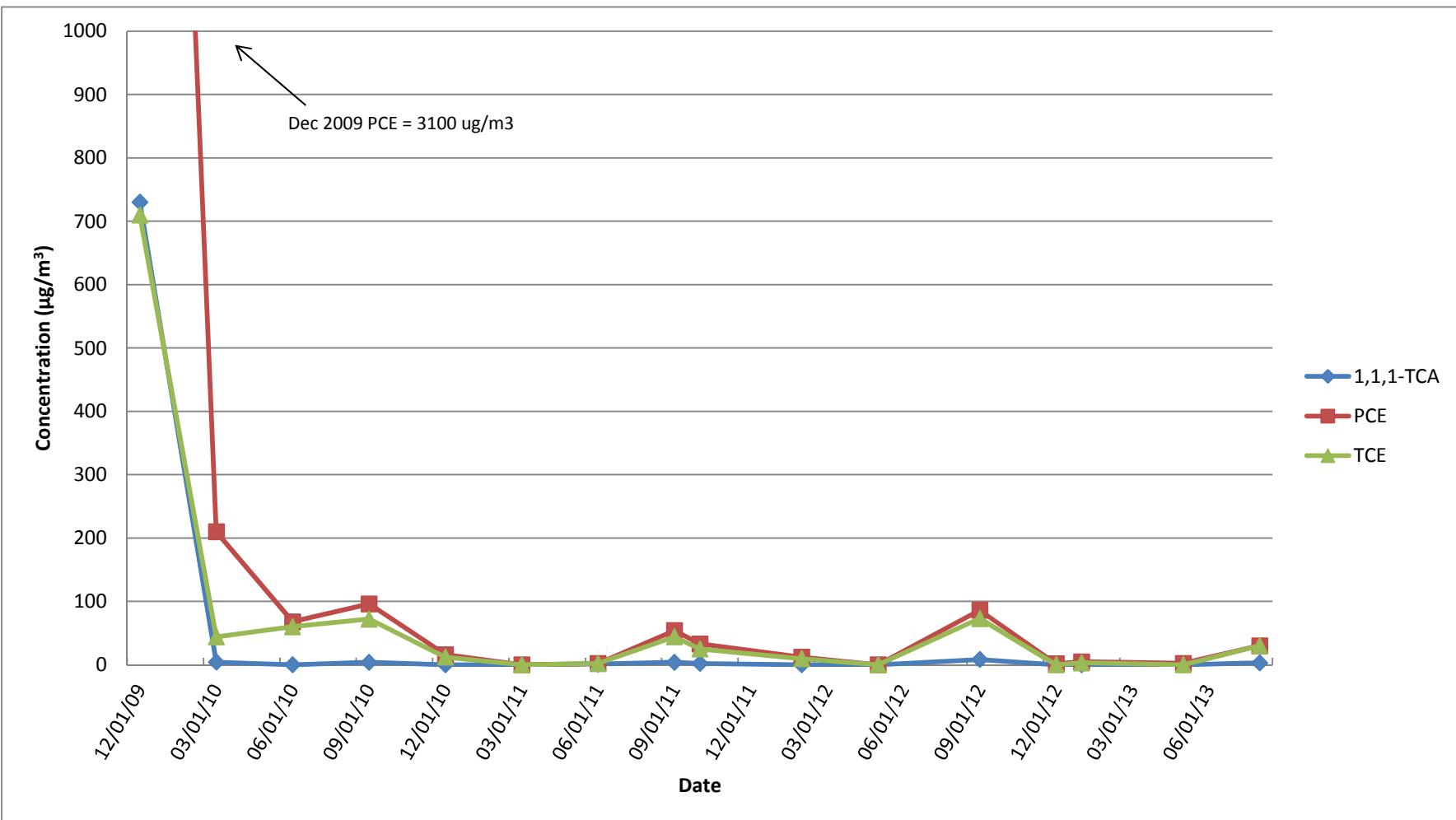
**Soil Vapor Extraction Containment System**  
**Site 1, Former Drum Marshalling Yard**  
**Naval Weapons Industrial Reserve Plant - Bethpage, NY**  
**Groundwater Concentration Trends of Select VOCs**  
**SV-103I**



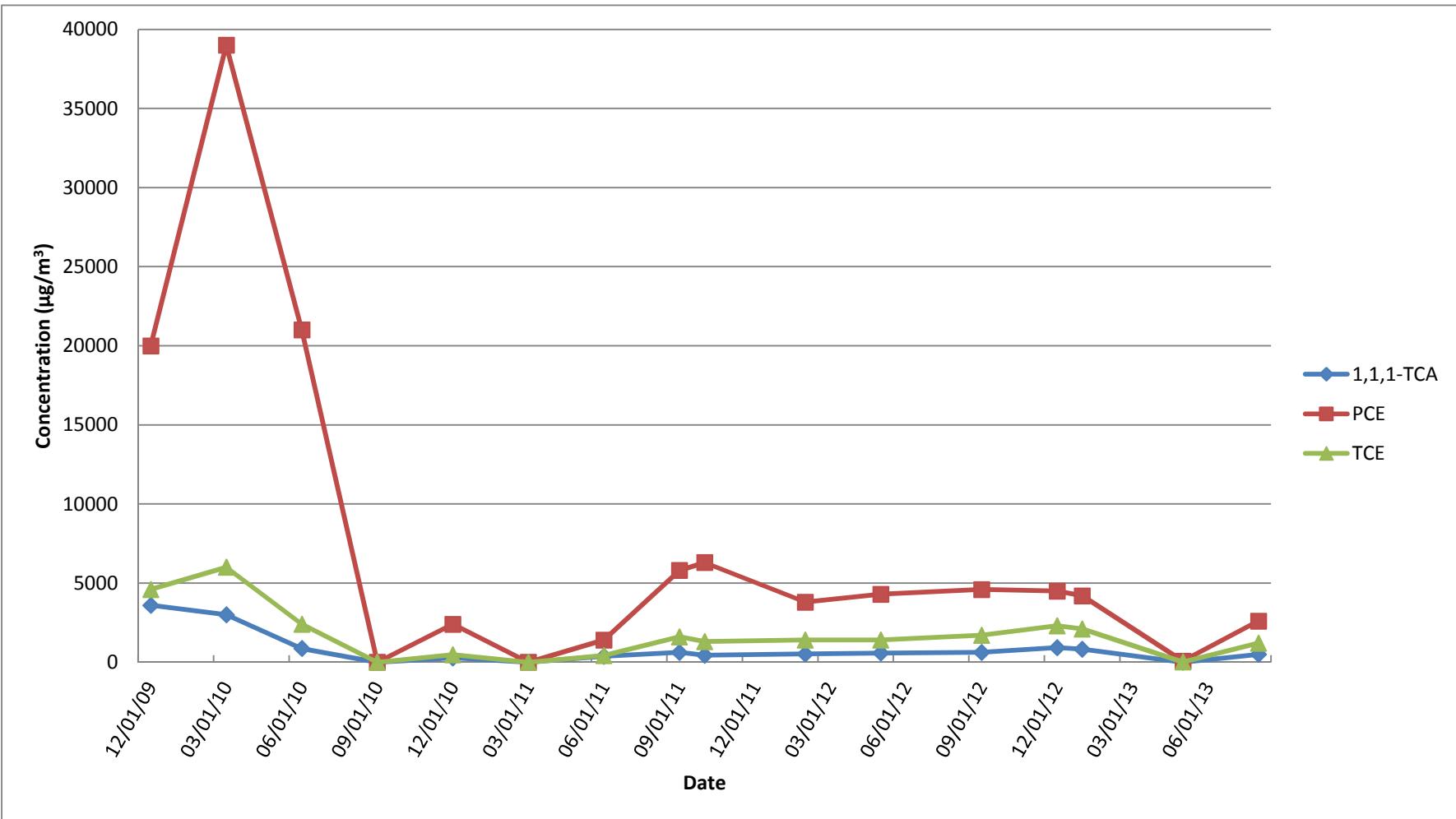
**Soil Vapor Extraction Containment System**  
**Site 1, Former Drum Marshalling Yard**  
**Naval Weapons Industrial Reserve Plant - Bethpage, NY**  
**Groundwater Concentration Trends of Select VOCs**  
**SV103D**



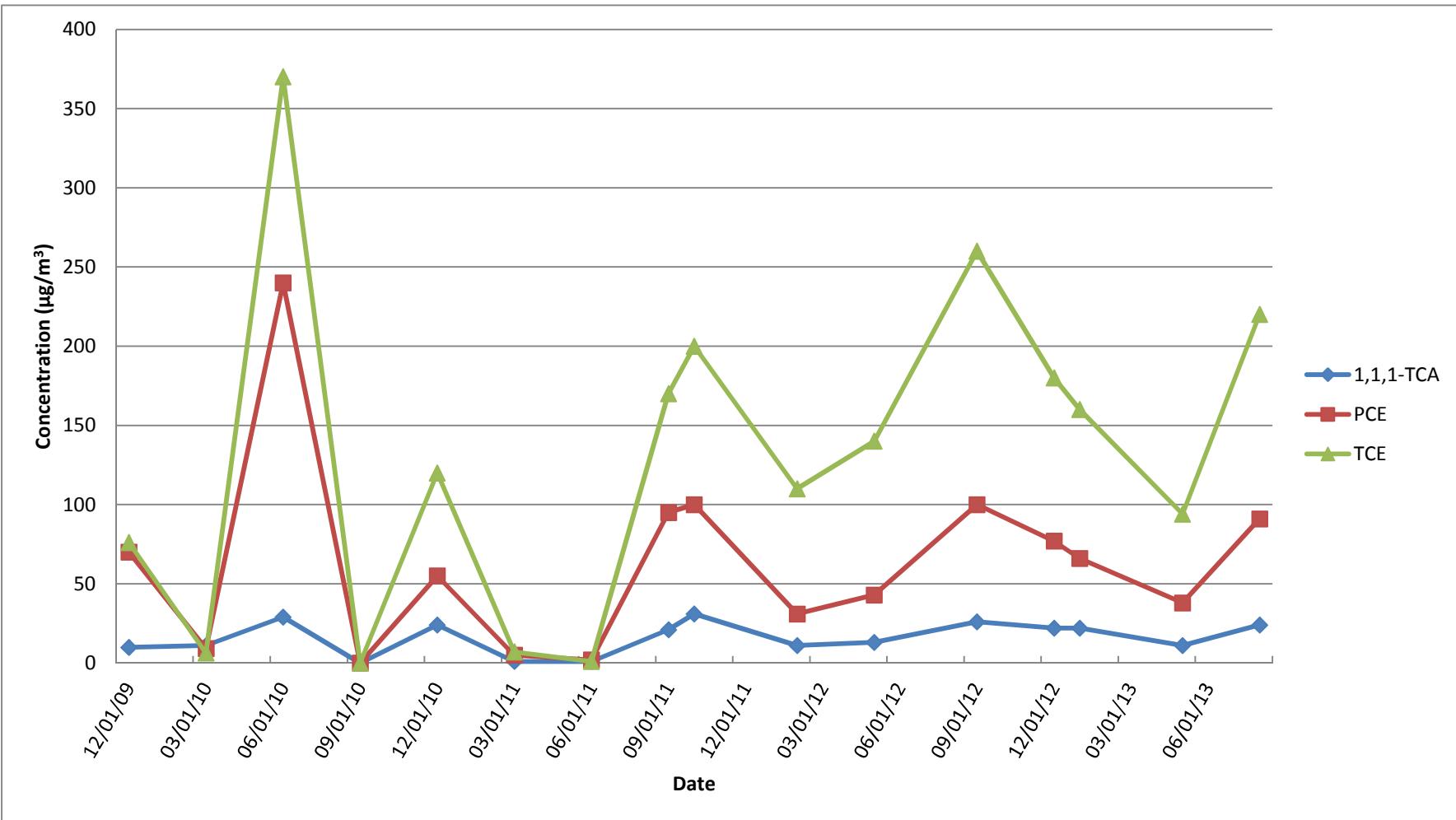
**Soil Vapor Extraction Containment System**  
**Site 1, Former Drum Marshalling Yard**  
**Naval Weapons Industrial Reserve Plant - Bethpage, NY**  
**Groundwater Concentration Trends of Select VOCs**  
**SV104I**



**Soil Vapor Extraction Containment System**  
**Site 1, Former Drum Marshalling Yard**  
**Naval Weapons Industrial Reserve Plant - Bethpage, NY**  
**Groundwater Concentration Trends of Select VOCs**  
**SV-104D**

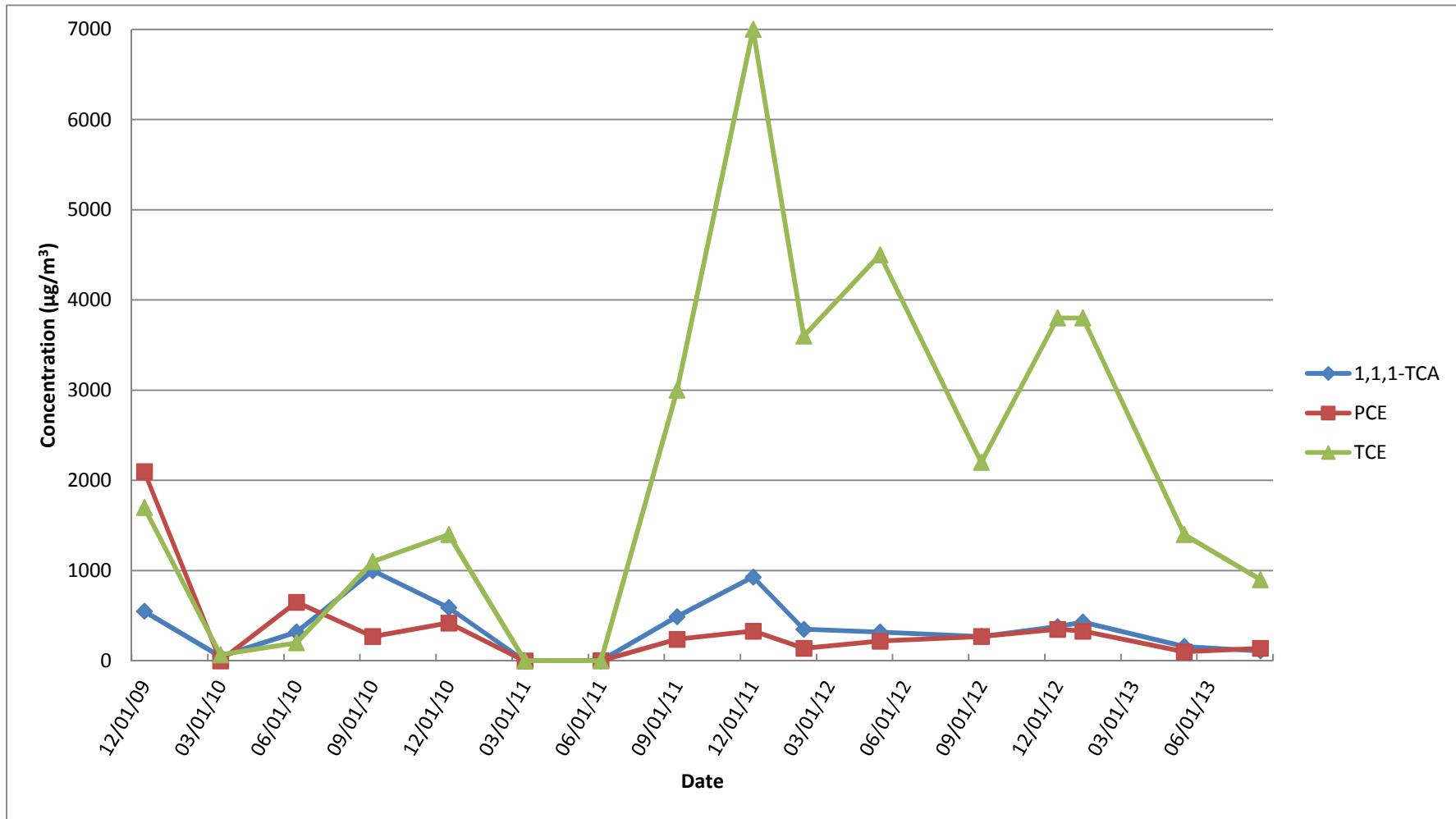


**Soil Vapor Extraction Containment System**  
**Site 1, Former Drum Marshalling Yard**  
**Naval Weapons Industrial Reserve Plant - Bethpage, NY**  
**Groundwater Concentration Trends of Select VOCs**  
**SV-105I**

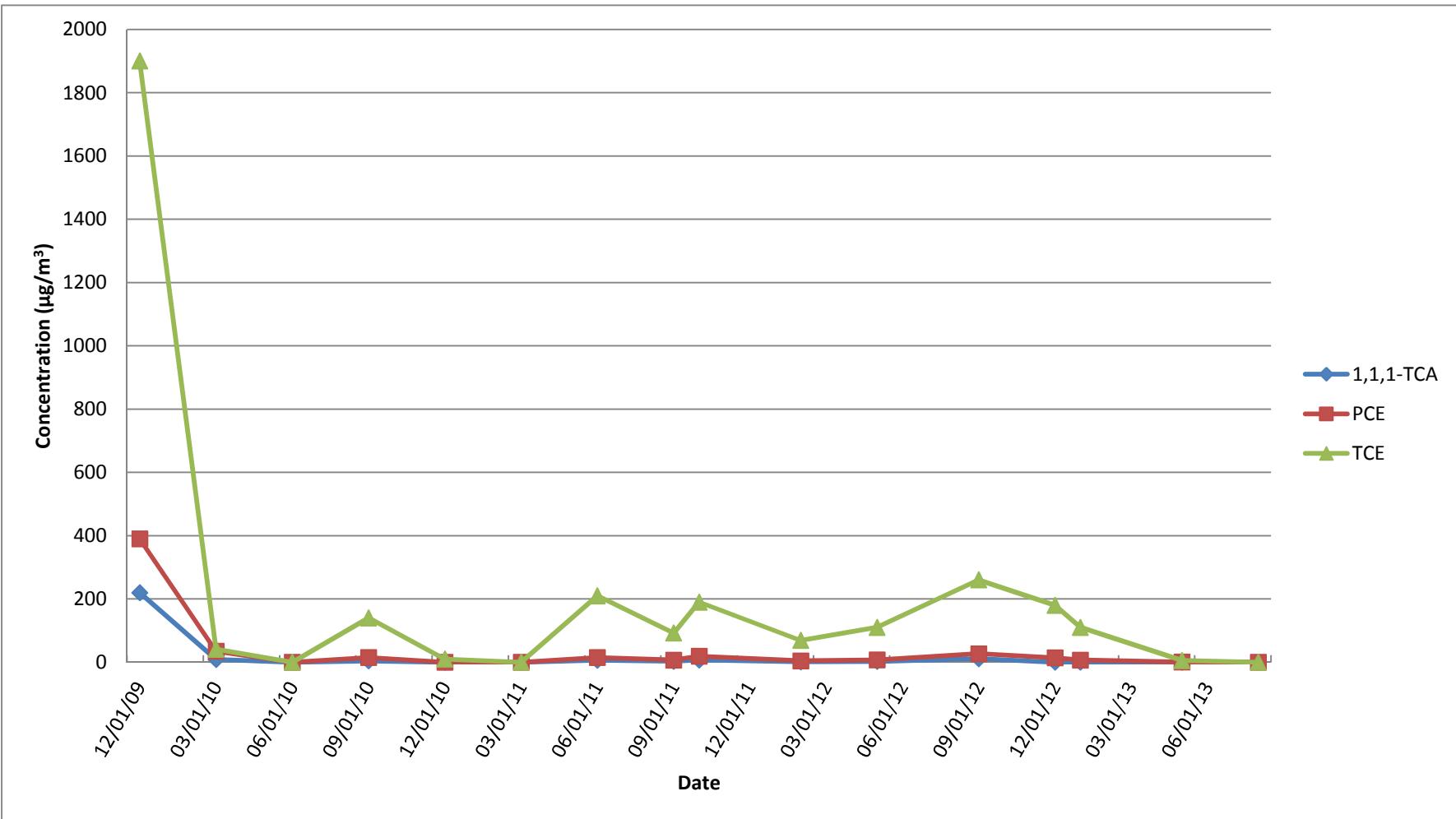


**Soil Vapor Extraction Containment System**  
**Site 1, Former Drum Marshalling Yard**  
**Naval Weapons Industrial Reserve Plant - Bethpage, NY**  
**Groundwater Concentration Trends of Select VOCs**

**SV-105D**



**Soil Vapor Extraction Containment System**  
**Site 1, Former Drum Marshalling Yard**  
**Naval Weapons Industrial Reserve Plant - Bethpage, NY**  
**Groundwater Concentration Trends of Select VOCs**  
**SV-106I**



**Soil Vapor Extraction Containment System**  
**Site 1, Former Drum Marshalling Yard**  
**Naval Weapons Industrial Reserve Plant - Bethpage, NY**  
**Groundwater Concentration Trends of Select VOCs**  
**SV-106D**

